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CONTENTS

		Page
1.	Editorial—Some Highlights ...	307
2.	Education in Tamil Nadu *By Miss Kailash Jhaveri* ...	370
3.	The Fifth Plan Approach to Science and Technology ...	385
4.	Correspondence ...	394
5.	The Third Census of Social Science Research in Tamil Nadu ...	S. 1–27

EDITORIAL—SOME HIGHLIGHTS

I. General Economic Scene

State

Fifth Plan: The Draft Fifth Plan forwarded by the State Planning Commission for Government study and comment proposes, as stated in Vol. III pages 153 and 226 of the Bulletin, a total outlay of Rs. 3,900 crores, divided into Rs. 2,690 crores in the public sector and Rs. 1,210 crores in the private sector. Of the Rs. 2,690 crores in the public sector, Rs. 1,010 crores are the Central sector outlay, Rs. 1,300 crores the Plan expenditure of the State Government and Rs. 380 crores sponsored by the Centre. The public sector is thus assigned a major and increasing role; in 1966-71 the public sector formed 61 per cent and private sector 39 per cent of Plan expenditures while in the Fifth Plan the percentages will be 69 and 31, calling for increased State involvement not only in infrastructure and production but also in commerce and the services. The growth rate (which has been 5.2 per cent during 1970-71-1973-74) is estimated for the Fifth Plan as an average annual rate of 7.4 per cent, moving up to 9.5 per cent during the Sixth Plan. As a result the State income will increase at 1970-71 prices from Rs. 3,218 crores in 1973-74 to Rs. 4,468 crores in 1978-79 and per capita income from Rs. 711 crores to Rs. 914 crores. This means annual sectoral growth rates ranging from 5.1 per cent for agriculture to 12.2 for animal husbandry, forestry and fisheries, implying improved sectoral growth rates over that envisaged for all India in the Fifth Plan; agriculture and allied activities envisaging 6.5 per cent growth for Tamil Nadu the corresponding all India estimate being 4 per cent, mining and manufacturing being 9.2 and 8.1 per cent respectively, electricity being 11.3 and and 10.3 per cent and transport and communication being 6.1 and 5.6 per cent respectively. The resulting structural improvements in sectoral incomes envisage a decline in the proportion of the income from agriculture from 30.10 per cent in 1973-74 to 27.05 per cent in 1978-79 and increase in the proportion of income from mining, manufacturing and small enterprises from 19.7 per cent to 21.5 per cent in that period. The total investment outlay of Rs. 3,900 crores needed to achieve the desired total sectoral growth in income of Rs. 1,340.45 crores at the overall incremental capital output ratio (ICOR) of 2.90 per cent breaks down into Rs. 267.38 crores increased income, Rs. 500 crores outlay at 1.87 ICOR for agriculture, Rs. 161.64 crores income, Rs. 236 crores outlay at 1.46 ICOR for animal husbandry, Rs. 157.06 crores income, Rs. 856 crores outlay at 5.45 ICOR for mining and manufacturing, R. 45.63 crores as income, Rs. 669 crores as outlay at 14.66 ICOR for electricity, Rs. 186.25 crores as income, Rs. 149 crores as outlay at 0.80 ICOR for small enterprises, Rs. 62.81 crores as income and Rs. 315 crores as outlay at 5.02 ICOR for transport and communication, and Rs. 459.68 crores as income Rs. 1,175 crores as outlay at 2.56 ICOR for services including commerce. The Draft Fifth Plan sets forth its employment planson the basis that the State

population will increase from 440 lakhs in 1973-74 to 489 lakhs in 1978-79, involving an increase in the size of the labour force from 176 lakhs and a backlog of unemployment of 48 lakh workers at the commencement of the Fifth Plan. The total employment at the end of the Fifth Plan period would be 160 lakhs against a labour force of 195 lakhs, involving the creation of an *additional* 32 lakh jobs and 35 lakhs remaining unemployed. In this rather sombre employment picture three points should be noted. First the pace of expansion of employment generation in the Fifth Plan is faster than the growth rate of the labour force resulting in a decline in unemployment from 48 lakhs in 1973-74 to 35 lakhs in 1978-79, being 18 per cent of the labour force. Second the expanded employment in the primary sector through enlarged irrigation facilities, promotion of modern agricultural practices and significant development in animal husbandry, dairying and fisheries, will offer full-time employment to the large number (112.49 lakhs) employed in it; so too employment in the construction industry will increase at a high annual 6.6 per cent rate, in manufacturing at 5.8 per cent, in mining and quarrying at 10.4 per cent and in services at 5.5 per cent annually. Third the major investment in basic infrastructure in port development, atomic power, core industries, R & D in dry farming and other sectors will be completed in early years of the Sixth Plan creating conditions of near full employment. In 1983-84 full time employment will be 2.06 crores against a labour force of 2.15 crores with a higher rate of employment increasing at an annual rate of 4.1 per cent. The objective of eradicating poverty during the Fifth Plan will involve raising the income level of the bottom 3 deciles of the population by around 50 per cent, while that of the top decile will be reduced by 2-3 per cent.

Perspective Plan: The Task Force on Urban Development and Tourism has proposed a perspective plan for tourism with an outlay of Rs. 42.5 crores for the period 1972-1984 against an overall requirement of Rs. 210 crores. It proposes the setting up of a Beach Developing Authority to develop the 1,000 km. of sea coast with its high quality beach sands and tourist attractions concentrating on the Madras-Mamallapuram, Ennore-Pulicat, Madras-Cuddalore, Porto Novo-Pichavaram, Tranquebar-Point Calimere, Rameswaram-Kilkarai Vimbar, Tuticorin-Koyallpattinam, Tiruchendur–Kanyakumari and Tengapattnam-Colachel-Kanyakumari stretches. The Authority will control and regulate all building and other activities in these areas. Loans up to 75 per cent of the cost from financial corporations and banks should be made available for the construction of hotels and lodges for students, youth and worker tourists along with catering arrangements for simple, cheap and clean food. The State's cultural heritage and handicrafts are to be publicised in museums in the major tourist cities of Delhi, Bombay, Calcutta and Agra and art galleries are to be set up in Madurai, Tiruchi, Coimbatore, Vellore, Cuddalore, and Tirunelveli. The development at Pichawaram, Mudumalai and Annamalai forests of integrated promotion of forests, wild life and marine life sanctuaries and beaches is proposed as part of the Centrally sponsored programme (see Vol. II No. 10 page 8 of the Bulletin). Package tours for tourists are proposed for Madras-Kancheepuram-Vedanthangal-Tirukalikundram - Covelong and Mahabalipuram and 6 other such round trips. Annamalai, Valparai, Sholayar, Koli Hills, Yercaud, Kodaikanal, Kotagiri, Coonoor and Ootacamund are to be developed as tourist hill resorts through constructing tourist bungalows, and improving existing facilities. New

airports at Salem, Ulundurpet, Nagapattinam and Tuticorin are proposed together with training of guides, opening of link roads to tourist spots, the provision of boating, swimming and picnicking facilities and landscaping and auditorium development at the tourist centres.

The perspective plan on employment emphasises manpower planning and developing an annual manpower budget based on the manpower content of the perspective plan projects and programmes, projected growth rates of State income and the future manning patterns by industries. This calls for educating corps of technical personnel in accordance with changing occupational patterns and economic activities as seen in the fall in demand for unskilled workers and the pick up in the demand for craftsmen and professionals recorded in the occupations reports of the Department of Employment and Training. The employment strategy of the perspective plan involves an investment pattern aimed at a labour intensive effort.

The financing of the perspective plan is is still under study by the Task Force concerned. On one source of financing—the shared taxes—the current position is revealing. In 1971-72 the State received as its share Rs. 37.80 crores out of Rs. 45.14 crores collected as income tax, Rs. 33.62 crores out of Rs. 191.24 crores collected as Central excise tax, and Rs. 76 lakhs out of Rs. 80 lakhs as estate duty and Rs. 4.26 lakhs as wealth tax on agricultural assets. The trend has been an increase in the absolute amounts received over the years. In 1969-70 the first 3 taxes' share of the State amounted Rs. 24.05 crores, Rs. 22.29 crores and Rs. 59 lakhs and in 1970-71 Rs. 29.47 crores, Rs. 27.24 crores and Rs. 64 lakhs. However the share from Central excises is around 22 per cent of what is collected from the State and this along with the share from surtaxes and those on corporate income should be examined by the Finance Commission in the interest of a fairer distribution.

District Plans : The perspective plans for 11 development districts were analysed in Vol. III pages 155-156 and 225-270. In this issue the plans for a further seven development districts are summarised.

The perspective plan for the North Arcot North Development District, divided into 5 sub-regions makes an assessment of Fourth Plan performance in the district. Paddy and millet seed distribution was good but fertiliser distribution was poor. Animal husbandry and dairying achieved their financial but not physical targets with similar comments on other sectors. For the perspective plan period, an outlay of Rs. 173.29 crores is proposed to be financed, Rs. 87.39 crores by the State, Rs. 34.21 crores by the Union Government and Rs. 51.69 crores by other sources. 16 per cent of the total outlay is for agriculture and allied activities, and 9 per cent for animal husbandry and dairying. For large, medium and small industries, which cover metal works, engineering and automobile ancillaries, art silk and weaving, Rs. 27.94 crores or 16 per cent of the total outlay is allocated. Primary and secondary education claim Rs. 22.27 crores (13 per cent). The rest of the social service sector including health, water supply and housing calls for an outlay of Rs. 48.62 crores. A rough employment estimate is attached to the plan which needs to be further worked upon.

The perspective plan for North Arcot South Development District, divided into five sub-regions based on primary land use, proposes an outlay of Rs. 80.39 crores for the Plan period. The Fourth Plan

performance in agriculture in this district is much more positive, while the industrial area is almost absent with little or no entrepreneurial ability. The largest sectoral programme proposed is animal husbandry and dairying for which Rs. 16 crores is proposed, which is 20 per cent of the total outlay. Agricultural and allied schemes call for an expenditure of Rs. 12 crores (15 per cent). The secondary sector will still be lagging in the perspective plan period with a small allocation of Rs. 8.09 crores. Social services are amply provided, with education at 16.3 per cent and other services at 24 per cent. The employment plan derived from these programmes needs to be estimated in terms of mandays. On the whole the plan proposed is rather a modest one.

The perspective plan for North Chingleput Development District divides the district into three homogenous sub-regions consisting of a predominantly wet farming area with dry pockets (sub-region I), a predominantly dry farming area with wet pockets (sub-region II) and an industrial belt of the Madras Metropolis (sub-region III). The evaluation of the Fourth Plan performance shows a higher illiteracy rate than the State average, a heavy employment concentration in the primary industry and the need to make agriculture viable by diversifying it and building in dairying, poultry-keeping, etc. Against this background, the plan proposes an outlay of Rs. 477.12 crores for the Perspective Plan period. The priority in the plan is the industrial sector under which TIDCO will help to operate units producing steering gears, television sets, films, gas cylinders, Naptha cracker and chemicals, leather and other ancillaries plus mining for which a provision of Rs. 268.69 crores is made. For agriculture and allied programmes an outlay of Rs. 59.09 crores is proposed, for power and transport Rs. 58.31 crores and for health, education and other development services Rs. 86.08 crores. Two innovations in the plan are an Academy of Tamil Culture for which a small outlay of Rs. 35 lakhs is proposed and district surveys on harijan welfare with an outlay of Rs. 8 lakhs. This is one of the more effective district Plans developed by the District Planning Offices.

The perspective plan for East Madurai Development District divides the area into four sub-regions, Madurai Corporation being the fourth sub-region. The plan evaluates the Fourth Plan performance as including increasing agricultural production in both food and cash crops, shortage of high yielding milch animals, 16.2 per cent of people having no water, good industrial potential yet to be developed and the need for regulated markets. An outlay of Rs, 220.51 crores is proposed for the district including Rs. 38.30 crores for the Madurai Corporation sub-region for the perspective plan period. The agricultural programme includes horticultural development, cotton and oilseeds schemes, development of milch cattle, poultry and piggery and soil conservation and water management schemes for all of which 48.16 per cent of the total outlay is proposed. For industry —large, medium, small and village—an outlay of Rs. 54.45 crores is proposed, being 25 per cent of the total. The large industries include nylon filament (Rs. 10 crores), caustic soda (Rs. 20 crores), and electronic equipment (Rs. 10 crores). The programmes in education (Rs. 11.84 crores), housing (Rs. 14.8 crores) and Harijan Welfare (Rs. 7.6 crores) are carefully planned, following the guidelines of the Task Forces as adapted to local needs. The health and nutrition projects are well elaborated while those of family planning are dealt with in summary form. The programmes proposed are estimated to create employment for 6.36 lakh persons during the perspective plan period.

The perspective plan for West Madurai Development District proposes an outlay of Rs. 266.46 crores for the period 1972-1984. It divides the district into 4 sub-regions, the first being a paddy growing area, the second and third being relatively dry land cash crops, with the Kodaikanal area forming a separate hill region. The evaluation of the Fourth Plan performance refers to such constraints as inadequacy of communication facilities, lack of adequate credit facilities and processing and research facilities. It points to 200 villages and hamlets having no drinking water supply and unexploited though limited industrial potential. The plan sets forth detailed schemes for dry farming in sub-region III, intensification of soil conservation, water management and land use, development of horticulture and crash programmes of poultry, piggery and milk production, starting a number of small and large industries, provision of drinking water supply, and education of illiterates and drop-outs. For the primary sector schemes, Rs. 153.28 crores representing 57.5 per cent of the total outlay are proposed. The industrial sector is small with Rs. 9.78 crores, the aluminium plant at Palani using up Rs. 7 crores. Power and transport schemes have been elaborated in some detail, calling for an investment of over Rs. 50 crores. The employment implications of the Plan and their effects on the development of backward areas need to be worked out.

The perspective plan for the North Development District of South Arcot divides the district into 3 sub-regions – wet farming, dry farming and mixed farming being the characteristics of the 3 sub-regions. In evaluating the performance of current projects, underutilisation of land particularly for vegetable and pulses production, the slow start in animal husbandry, the need to build flood banks on the river Pennaiyar in the flood prone areas, the poor maintenance of panchayat roads, the need to develop small and cottage industries and meet the growing pressure for health services are stressed. The perspective plan for the district provides for an outlay of Rs. 232.22 crores for the Plan period 1972-1984, with emphasis on the primary sector, an extensive system of roads and the provision of the basic minimum services needs. The primary sector is allocated Rs, 64.08 crores which is 25 per cent of the total outlay for HYV extension particularly in pulses, oilseeds, fruits and vegetables, development of poultry, piggery, and sheep and dairying and milk production. The industrial sector provides for a fertiliser plant at Ulundurpet (Rs. 74 crores) and medium, small and village industries (Rs. 16 crores). Rural roads are to be constructed for Rs. 6 crores and for social services and cultural promotion Rs. 73.79 crores are provided. The employment generation of these programmes is estimated at over 1 million mandays. The plan makes a powerful plea for arming the panchayat unions with adequate financial powers and responsibilities for both plan formulation and execution.

The perspective plan for the South Development District of South Arcot is based on an analysis of potentials, constraints and needs of its 3 sub-regions – the wet farming, dry farming and industrial sub-regions. The Fourth Plan performance of operating projects in the sub-regions is positive in terms of total production with constraints of low per acre yield, poor exploitation of fishery resources and minor irrigation potential, the large number of villages without drinking water and adequate health facilities and inadequate development of the industrial resources of sub-region III. As sub-region I is part of the Cauvery delta, the

primary sector is allocated Rs. 59.31 crores which is 28.65 per cent of the outlay, with emphasis on IADP, the Intensive Cattle Development Programme and development of village forests and fisheries. For large, medium and small industries an outlay of Rs. 46.92 cores amounting to 22.67 per cent is proposed. The Plan for the development of sub-region III—the industrial belt of the Cuddalore-Neyveli complex—involves promoting satellite areas around Neyveli as growth centres consisting of Panruti, Vadaloor, Vridhachalam, Cuddalore and Nellikuppam, wherein paper mills at Kallakurichi and Pennadam, a caustic soda plant at Chinnasalem, a calcium carbide plant at Vridhachalam and many small and village industries which are agro-based are proposed. The development services of water supply, health, education, housing and backward areas development have been well planned with an outlay of Rs. 86.47 crores or 41.76 per cent of the total outlay. The plan attempts successsully to build future distribution policies into the pattern of production.

Prices : The price rises in the State referred to in Vol. II No. 12 page 6 of the Bulletin has been intensified by the power cut. In some areas, the dealers are attempting to make up their reduced cash income due to shorter hours of work by increasing the product price. The grinding charges of the flour mills (which used to function for 6 hours a day now reduced to 1½ hours) have been increased from 10 paise a measure of rice and wheat to 30 to 50 paise and from 40 paise to Rs. 1.50-2.25 for the chillies-coriander mix. To deal with the general price situation, the Government is taking four measures. First in line with the national decision, the wholesale trading in rice to be taken over from the next kharif season is under study. Second through the Tamil Nadu non-food stuffs order issued in early March, it has assumed powers to fix the maximum selling price of certain non-food articles like yarn, dyes and chemicals, diesel engines, lamps and cement. Third it is planning to take over the entire retail trade in kerosene which would be distributed through the co-operatives and model shops. Fourth on the recommendation of the estimates committee of the Assembly, the use of a three-tier co-operative organisation—the consumer co-operative including the super market and the mini super market at the base, wholesale stores in the middle at the district level and the State Co-operative Federation at the apex—is under consideration as a means of holding the price line and countering price increases. The key here is the base consumer co-operatives which should be improved and increased and given distribution rights of scarce and controlled articles, and those handled by the Civil Supplies Corporation. This price control programme is a priority to ensure safeguarding and improving the well being of poverty sectors and providing a firm base for the Fifth Plan programming.

Power : March and April saw further effects of the 75 per cent power cut in the State. In the State 1,000 diesel generators have come into use. (For the Country as a whole 4,000 diesel generators have been activated increasing the demand for diesel oil in the Country by 150 million litres per month). The result was a serious shortage of diesel oil in the State and the efforts to import 24,000 litres of foreign diesel oil which assured a month's supply. Madras Refineries has had to step up the output of HSD from 36,000 tonnes to 50,000 tonnes a month and other refineries doing the same has resulted in some reduction in kerosene production from the refineries

and tight kerosene supply. Another unit affected by the power cut is the Arkonam concast plant whose 25 tonne furnace requires about 7.5 MW of power. It has not been able to receive this supply and so has had to suspend production from mid—February. On the other hand the power supply to farmers which was limited to four hours was extended to five hours from early March to help the rabi production programme. As pointed out in Vol. III page 7 of the Bulletin, there is now a general consensus that the Fifth Plan programmes and the overcoming of the current crisis demand a doubling of the power generating capacity of the Country by the end of the Fifth Plan (given the 70 per cent consumption by industry which is planned to grow at 8-10 per cent against the six per cent attained so far), that this is not likely to be attained on present methods of power generation (in place of the current 0.5 to 1 million KW annual increase, the Fifth Plan target calls for a 4.5 million KW increase per year) and therefore the need for a total energy and energy substitution programme is being accepted. Even if the Fifth Plan target of doubling energy production from 20 million KW to 40 million KW is attained and the present power shortage of 35 million KW hours a day is removed, the average per capita consumption in the Country will be 200 KW hours against the world average of 1,300 KW hours. A further target being proposed is that by 2000 A.D. the world average per capita power consumption should become that of the Country's. It is against this background that three power processes for the future are being developed. The first is the total energy process under which the 200 large industries in the Country can save Rs. 70 crores annually on fuel and produce in addition more than 2,000 MW of electrical power for their own use by initially investing Rs. 100 crores on high pressure boilers and turbines to enable them meet simultaneously their demand for electricity and process steam. The same amount of fuel is needed to raise the steam pressure to one PSI or to 1,500 PSI. Such total energy stations can be set up at Amritsar, Trombay, Ahmedabad, and may be Madras and Coimbatore where there are large concentrations of industries, provided the State Electricity Boards allow the industries to produce their own electricity in addition to steam. For this, high pressure boilers and back pressure turbines must be produced in the Country. Meanwhile a 2 MW magnet hydro dynamics (MHD) generator has been designed by the NCST where power is produced by a very hot electrically conducting gas flowing down a duct lined with electrodes and surrounded by a magnet which can also run a turbine and produce additional electricity in a conventional plant, thus using fuel fully and efficiently. This first pilot can be followed by developing 24 MW and later 500 and 1,000 MW MHD generators. The second process is to save on our rather huge transmission losses (see Vol. III page 230 of the Bulletin). While in 3 States and DMC the losses are less than 12 per cent and in six States less than 15 per cent, in Tamil Nadu and 7 other States, where one third of the total electricity of the Country is produced, the transmission losses are above 15 percent. The Country loses around 1,000 million kilowatt hours in transmission losses and for two thirds of it (6,000 million kwt) the losses are normal and unavoidable due to power stations' loss in transmission to distribution points (4 per cent), the heating of overhead lines particularly when made of aluminium, and even in some underground cables. In all Countries losses up to 12 percent are unavoidable. It is the losses in this State and the other 7 where the losses are in the neighbourhood of 18 percent that action

must be taken to reduce them, through bringing loads close together and avoiding long supply lines, using high voltage underground cables which cost 12 times more than overhead lines, and switching from AC to DC, which also is more expensive in machines. There are further prospects in the use of super cooled cables which will reduce the losses to zero and in the power stations using the heat to produce hydrogen gas (rather than electricity) which when transmitted to consumers —industries or homes—in pipes or bottles can produce heat and generate the needed electricity. These are some of the lines for adaptive research in this State and the Country. The third process is to develop the geothermal resources of the Country (see Vol. III page 232 of the Bulletin). It is also necessary to establish a better balance between thermal and hydel generation in this State, unlike Kerala and Mysore which can depend on hydel power. For this, a combination of coal/oil fired thermal and nuclear stations should be established during the Fifth and Sixth Plans. 50 percent of the needed power plants will have to be imported and the design defects, poor maintenance and shortage of fuels and spares in existing thermal plants leading to under utilisation of capacity remedied by special training of thermal engineers and technicians.

Meanwhile the Union Government has cleared the import of 35 250 KVA generators from Czechoslovakia and Rumania to meet the urgent power needs of the State. The import of sets below 250 KVA capacity for the industries in the State is also being examined for early action as an exceptional measure, because normally these sets should be purchased within the Country. There is a similar need in relation to the Kundah hydel project which is one of the ten projects in the Country being held up due to the delay in import of power equipment (which would add 1,089.2 MW to our total capacity). The import has now been authorised. The State is also taking action to increase diesel supplies by 50 per cent for use of the diesel generating sets now in use and being imported and to accelerate and improve the distribution of the existing allocations within the State. In March one tanker discharged 48,000 kilo litres (instead of the 24,000 kilo litres expected) at the Madras port and this kind of supply is to continue. Also Neyveli has increased its power generation from 300 to 350 MW and its supply to the State grid from 5.7 million units per day to 6.7 million units from March 1 and from March 26, it further increased its generation to 40°MW and its daily supply to the grid to 7.8 million units. Further Kerala supplied 50,000 units additional power from April 5 raising the daily supply to 3.5 lakh units. This costs more at 25 paise per unit, the other 30,000 units being priced at 9 paise per unit and the 3 lakh units supplied from the end of February (see Vol. III page 231 of the Bulletin) at 6¼ paise per unit. This additional 50,000 units is being provided by Kerala for the State's tyre manufacturing and cement units (in addition to 1 lakh previously earmarked for cement factories) so that it can be assured of a continuing supply of tyres as well as cement. When the Idikki project is completed by 1974 Kerala will be able to supply Tamil Nadu with even more power. Work on the 400 MW Kadamparai pumped storage scheme has been started. The Kalpakkam atomic power project is also being stepped up and because of the enclosed switch yard which is being installed in it, unlike the exposed ones in Rajasthan and Tarapur, its uninterrupted power generation is assured from 1977. Its expansion this year or at the start of the Fifth Plan should also be decided now. From 1 May for 3 months Maharashtra will supply this State 3

million units per month in return for 75 per cent of the additional yarn that will be produced with this additional power supply. The sea cooling problem at Ennore has been solved through use of the Dutch dredger which is clearing the sand bar and enabling the fourth set of 110 MW capacity from Czechoslovakia to function from early May, adding generation of 200 MW a day (from two 60 MW sets and one 110 MW set). Construction of the Fifth 110 MW set is also underway and should start operation in 1976. The Basin Bridge plant is generating 60 to 65 MW. There is a problem of coal supplies to Basin Bridge and Ennore which together require 97,000 tonnes a month. As the Singareni collieries can supply only 35,000 tonnes, arrangements are being made to move coal by railway from Talcher and Chanda mines and by sea through the South India Shipping Corporation from Calcutta and Bihar. Thus, of the current daily requirements of 15 to 16 million units, 7 million units is produced by Neyveli, 4.5 million units from Ennore, 1.2 million from Basin Bridge, 2 million from hydel and the balance from Kerala. Mysore supplies power for peaking purposes, which is returned at night in a daily no balance basis. In addition as noted earlier, the fourth set at Ennore will be producing 1.5 to 2 million units more a day, so that for the State there will be no further cut this summer. If anything the power situation will improve. The April session of the State Assembly passed the bill to take over private electric supply undertakings after paying 10 times the average annual profit of the unit during a period of 5 consecutive years, the actual amount being determined by the Government and the licensee or by arbitration. This Act should be so implemented as not to involve a heavy financial burden and as a means of coordinated, rationalised and accelerated power supply and distribution in the State. Its priority at this moment of the power crisis will be judged by these factors.

Water: The Cauvery Fact Finding Committee (see Vol. II No. 9 page 5 of the Bulletin) submitted to the Union and Tamil Nadu, Mysore and Kerala Governments a 150 page report providing factual data on land and climatic conditions, water resources and development of irrigation facilities in the 87,144 sq. km Cauvery basin, together with the cases and claims of the three States on the waters of the Cauvery and its tributaries. The report provides a sound and adequate basis for the 3 State Governments to negotiate and arrive at an agreement on the long standing disputes between the 3 States on the utilisation of Cauvery waters. The Chief Ministers of the 3 States met on April 30 with the Union Minister of Irrigation for this purpose. There are needs that the people of all 3 States face and these needs can and must be met within the existing water resources. A start for the settlement would be the extension of the 1924 agreement which expires in 1974 for a long term period and settlement of all claims by technical discussions and negotiations or by arbitration. Mysore in the early sixties started work on the Hemavathi and the Kabini projects, despite opposition by the Union Government and the Government of Tamil Nadu's concern for Thanjavur district, the rice bowl of the South and the Country and its dependence on the Cauvery waters and the Government of Kerala's concern for the Kabini dam being constructed by Mysore which would inundate sizeable areas of Kerala. Mysore in its turn claims its rights to the full 45 tmc of water allowed to it under the agreement. All these disputes can be settled at the technical level in terms of the river water availability. If the

demands of the 3 States cannot be met with existing and future quantum of water, and they cannot because against a total availability of 21,000 million cubic metres, the demands of 3 States exceed 35,000 million cubic metres then this State will have to provide some accomodation to Mysore to meet the needs of its drought prone areas and in turn Mysore will have to prune its projects and conform to established international procedures governing riparian rights. At this first meeting between the 3 Chief Ministers there was (a) agreement as to the total quantum of available water, namely 20,956.83 million cubic metres, (b) a directive to the fact finding committee to find out how much each State has been using of the waters and the extent of the irrigated areas in the 3 areas using the Cauvery waters, (c) to meet again after 2 months when the committee's findings are available and (d) to settle the dispute by negotiations. This is a small gain.

Twenty nine water supply schemes costing 8.45 crores are to be executed in the State this year with loan assistance from LIC. In addition to existing protected water supply in 80 municipalities, 8 townships, and 31 town panchayats, new schemes are being executed in 10 municipalities and 29 panchayats. The Government has also set up a Standing Committee (reconstituting the previous water and sewage purification committee) to deal with all aspects of water pollution in the State and advise the Government on the clauses to be included in industrial licenses for new industries and their potential for industrial wastes and pollutants. It is also necessary that this committee should help in controlling and regulating the pollution effects of existing industries. Experiments in artificial rain making are underway in and around Tiruvallur in Chingleput district until the end of the south west monsoon season. Rain bearing clouds are being seeded with sodium chloride particles from a land based generator. The 70 rain gauges installed in a 40 km area around Tiruvallur will record the rainfall amounts induced by the seeded clouds and compared with the rainfall outside the area to decide on the effectiveness of the technique. There are major stakes for the dry farming regions (which is the majority of our farming area) of the States in this experiment.

The desalination project recommended by the State Planning Commission's Task Force on Health, Family Planning, Nutrition and Sanitation (see Vol. II No. 9 pages 32-35) has been taken up by the Kalpakkam atomic energy power station and preliminary work on a prototype desalination plant using the evaporation process has started. On the basis of the feasibility study to be completed this year, the plant will convert 1 million gallons of sea water per day into fresh potable water. This represents an important breakthrough into the potable water resources of the State and the Country. The first unit of the station, the 40-45 MW fast breeder reactor, will become critical by the end of 1976 and the second unit by the end of 1978.

Housing and urban development: The 20 year plan (1971-1991) for the major urban development of the Madras Metropolitan Area covering 456 sq. miles of the Madras Corporation, 3 municipalities, one cantonment, 24 town panchayats and a large non-urbanised area at a cost of Rs. 938 crores has been accepted by the Government and placed before the April session of the Assembly. The financing of the Plan will be through Union Government and State loans and grants, mopping up urban land value increases, using profits from urban renewal and remunerative enterprises and through a development

charge. Some of the new facilities would be the North-South metro linking Ennore-Manali with Tiruvanmiyur, the start this year on the Ennore-Manali urban node because of the rapid growth of industries in that area and for which a provision of Rs. 20 lakhs is made in this year's budget and the development by the Madras Metropolitan Development Authority of detailed operational plans for developing Sengundram near Chingleput as a means of checking migration to the city (see Vol. III page 164 of the Bulletin). In addition the Government with the approval of the Assembly has constituted the Urban Development Fund to be built up from contributions from the urban land tax and surcharge on sales taxes in Madras, Madurai, Tiruchi, Salem and Coimbatore starting with Rs. 1.5 crores this year for development of urban areas and their roads and water supply infrastructure. The State Highways Department which completed a detailed traffic survey of the city in 1971 has concluded that the intensity of traffic is rapidly increasing for which the existing roads are inadequate. It has prepared a Rs. 120 crores scheme for an underground express way from Teynampet to Parrys to relieve the increasing traffic congestion. The Union Minister for Housing has called attention to Madras having the third largest number of pavement dwellers at 9,000, after Bombay with 59,000 and Calcutta 49,000. Against this, the 48 slum clearance schemes currently in progress, the completion of 7,818 tenements by 31 March 1973 and the Union Government grant of Rs. 2.5 crores for providing basic amenities in 162 slums covering 1.13 lakh people are significant. With the help of SIDCO, small industries like a printing press and cover making unit are being established in the tenement areas to provide employment opportunities to the persons living in them. The Government has requested Rs. 10 crores annually from the Union Government for slum clearance in the State. Further to HUDCO's grant for a wood work unit referred to in Vol. III page 164 of the Bulletin, a loan of Rs. 6.5 crores has been given by it for new houses for 4 major colonies. The Tamil Nadu Housing Board has started a new scheme to build houses at a cost of Rs. 10,000 (excluding land value) for a down payment of 10 percent (instead of the 25 per cent required under other schemes) and a monthly payment of Rs. 100/- till the loan is liquidated. The scheme is for salaried classes and has been taken up on a wide scale in Tiruchi, Thanjavur, Salem and Vellore. Other schemes include " the save a rupee a day housing scheme " operated with the help of the Syndicate Bank (with Indian Bank also joining in) under which the monthly savings are collected and credited to each member and at the end of 5 years the Board is given Rs. 1 crore to build houses for members, a Rs. 6,500 house scheme for handloom weavers with a large room to house the loom, a Rs. 15,000 residence-cum-clinic scheme for doctors in rural areas on payment of 20 per cent initial deposit and for which LIC has provided the finance and a scheme for 300 hostels for Harijan students. For all these programmes all resources—public and particularly private resources—need to be mobilised. The April session of the Assembly passed the Tamil Nadu Buildings Bill which fixes a fair rent at 6-9 per cent of the cost of the buildings for residential and 9-12 per cent for non-residential purposes. This will help in assuring reasonable rents particularly in urban areas. The rural housing problem in the State is also being gradually dealt with. A Rs. 50 lakh village housing project is underway under which 1,100 houses are being constructed in 223 villages. Each house is built with a loan of Rs. 4,000 which covers 80 per cent of the cost. It is planned to extend this important programme to 1,640 villages.

Tenancy Bill: The April session of the Assembly adopted the Cultivating Tenants (Right to purchase land owners' rights) Bill which confers the right on the tenant to purchase the land he is cultivating from the owner, provided the total extent of land held by him as owner, and cultivating tenant does not exceed 5 acres. It exempts 10 standard acres owned by religious, charitable and educational institutions and 2 standard acres owned by a minor, widow or disabled person from its provision. The purchase price of the land is to be settled by agreement or in its absence at 12 times the fair rent plus half the value of structures, wells and pumpsets installed by the landlord, payable, when necessary, in 12 equal installments. If the tenant can pay the whole amount, then he need pay only 75 per cent of the total. This Act continues the measure for protection of tenancy rights and rent control and its effectiveness in terms of improved agrarian conditions will depend on its implementation. From this point of view the time has come to bring together all agrarian reform measures in a single bill and organise special training programmes to inform and secure the participation of the rural community and train the officers who are the kingpin in its implementation.

Gudalur encroachment : 11,352 acres of Government land including forest land had been encroached upon in the Gudalur taluk between 1952-September 1971. With the small and diminishing percentage of land in the State under forest, every enroachment has to be resisted and the State Planning Commission's Task Force on Forestry has made forthright recommendations to this effect on the subject (see Vol. II No. 12 pages 2 and 3 of the Bulletin). The Government action to regulate the Gudalur evictions was very generous in fact against the Task Force recommendations, but in terms of many of the encroachers being from the neighbouring State of Kerala took on inter-State overtones, due to intervention by communal forces. The settlement effected by the Government was fair. 9,757 acres of encroachments have been assigned to 9,379 families, each family being given a 3 acre patta. 1,523 families who encroached after September 1971 were evicted from 1,555 acres which included revenue lands on which the forest department had raised plantations at a cost of Rs. 4,000 per acre. In the February disturbances in the area caused partly by misunderstandings and partly by fomenting inter-State tension, Government eucalyptus and bamboo plantations valued at over Rs. 50.00 lakhs were destroyed and this is a serious setback to the forest development programme of the State.

National :

Fifth Plan : The Approach to the Fifth Plan document (see Vol. II No. 12 pages 8-10, Vol. III pages 12-14 and 165–167 for summary and comment) together with the worksheets behind the Approach Paper in the form of a technical note was reviewed by the Union Planning Commission's panel of economists at two meetings in April and May. The main issues arising from this review for the elaboration of the Fifth Plan may be briefly summarised. (1) The Approach document and the consistency model (the static Leontief inter industry model) on which it is based represent a high degree of excellence in Indian Planning, similar to the Mahalanobis Investment–Production model for the Second Plan which enabled the planners to work at the plan integrally. In this model for the Fifth Plan for the first time the pattern of planning production takes into account the pattern of planning consumption. As a result, the growth rate is the result of

the pattern of consumption and of food production. It is in this sense that the Fifth Plan model builds a sound growth rate and a thrust toward equality recognising that this must be induced and is not automatic. (2) The Fifth Plan model is not a closed loop model because the data for all the links for making such a model are not available and even if available should not be used as that would give no policy options to the political authority. The Plan decisions are political decisions and the planner must not present the political decision maker with a dead end. (3) The technical note clarified a number of issues. In a sense the Approach document is one of the most non-self contained documents. It has 27 references to exercises, models, studies and assessments and only in 5 cases are these references followed by actual listing of the tables. It is necessary therefore, to have the technical note in order to understand the Approach document and its proposed strategy and computations. Further the technical note makes some corrections of the figures and variants proposed in the Approach document, the most important being that the Approach document (page 18 para 9) proposes the monthly per capita consumption of the richest 30 per cent decline as between 1973-74 and 1978-79 from Rs. 84.42 to Rs. 80.38 in the case of the rural rich and from Rs. 113.21 to Rs. 108.07 in the case of the urban rich, the technical note on the other hand corrects this estimate (pages 37-39) in stating that the consumption of the highest decile in the rural area declines by 3.09 per cent and the highest quintile in the urban area declines by 2.09 per cent between the two years. It is necessary, therefore, that the technical note be also made available to the State Planning Commissions and Boards so that they may understand the bases and implications of the Approach Paper proposals and adapt them to their plan exigencies. (4) The Fifth Plan Approach Paper model is a simplified input-output consistency model and its future improvement and sophistication for the Sixth Plan calls for developing data gathering techniques in 3 important areas—the first is the income profile and distribution matrix for the Country, the second is the capital coefficients for the inter industry model from which the gross fixed investments can be derived and the third is the employment profile for the Country on the basis of the Dantwalla Committee matrix in place of the labour coefficients for HYV areas, dry farming, per acre, per quintal measures, etc. on which the present model is based. On the question of whether in the absence of this kind of data, a simplified model when used as at present might not be misleading, the answer is that the Approach Paper model provides a satisfactory directional change and should not be taken to indicate the dimensional change. The Approach Paper is a strategy document, not the final plan document. But even the final plan document on this occasion will not provide us with the missing links between production and income, between the income pattern and consumption pattern, between the employment pattern and income pattern because of the absence of data as referred to earlier. It does and will point to the institutional changes needed, — on urban poverty, agrarian ceilings, control of black money, etc. (5) The restraints on consumption proposed on the top 10 per cent of the rural rich and top 5 per cent of the urban rich raise a number of difficult and complex issues. Does the strategy popose increasing income inequality and increasing consumption equality? (Actually it does not specifically propose or assume increasing income inequality, but it does not propose restraining income generation of the top decile or quartile at the source). What

are the instruments for restraining consumption of this group, given the fact that for this group with its price inelasticity, higher taxes on luxury goods will not lead to their lower consumption? In some cases higher prices caused by higher taxes may actually lead to higher consumption for this rich group. (6) How does this factor of increasing income and declining consumption (if granted) result in increased savings for this group? This is the group which saves sizably. The Approach document has a note of despair about the savings capacity of the public sector enterprises on the basis of the past and present record. It therefore, proposes a new approach to the functioning of the public enterprises. Will there be the managerial talent and the right political decisions to make the proposed capacity use a reality? In face of all of this, the large savings target proposed requires working out of instruments—indirect and indirect taxes, in borrowings, in forced savings, etc.—which have not been spelt out. (7) The pattern of growth proposed, 5.5 per cent, with 7 per cent export growth, also needs further examination. What is the basis for this rate against the 2 decades 3-3.5 per cent performance? Is a 4 or 4.5 per cent rate or a 6 per cent with 8-9 per cent export growth rate not more realistic? The key to the 5.5 per cent growth rate is the food grains growth of 4.7 per cent. Is this realistic? If it is, does it not call for a pattern of investment different from that proposed in the Approach Paper-with emphasis on the extensive margin rather than on the intensive margin, with heavier investment on irrigation, multi cropping patterns and dry farming than now proposed? In any case there seems a strong case for developing an agricultural sub-model to answer some of these questions and not to aggregate agriculture and allied activities under the 5 heads as is done in the 66 × 66 model in the technical note. (8) The two variants of consumption set forth in the technical note 3c + 3d, ie. in 3c in which there is increase in consumption of the poorest 30 per cent by 4.72 per cent and in 3d by 14 per cent, to Rs. 36.64 in the rural and Rs. 39.64 in the urban area (pages 36-39),—raise a number of issues. It is stated that the second preferred variant makes for social equality and has no dampening effect on growth. But the latter is true only of the core sector. In the raw materials sector the preferred variant has a serious dampening effect on growth. Further how is the resource transfer to take place between the top 10 per cent to the bottom 30 per cent? Production and employment can at its maximum transfer only half of what is desired, the rest will have to be in some form of dole. With declining role of direct taxes in the total tax revenue system (it is today 12.5 per cent against 22 per cent in 1950), taxation cannot be the means for the transfer. It will to be through public expenditures. Thus given the fact that no preparation to date has been made and that there is no realisation of the enormity of the effort called for in changing the production pattern, restraining consumption of the rich and the exporting of luxury items, the preferred variant should be achieved not by the end of the Fifth Plan but by the end of the Sixth Plan. (9) The ICOR which is certainly consistent with the model is at a high 3.14 for the Fifth Plan, against the unreal 2.33 for the Fourth Plan. In fact FAP projections indicate that the ICOR for Agriculture may move to nearer 3 rather than the 2 proposed in the Approach Document. There is then the problem of this high ICOR being incompatible with the full or higher employment objective of the Fifth Plan. (10) There are problems also raised in the prices and wages policy. How is price stability to be achieved, if there is a shortfall in food grains production? What is the purpose

of a price policy? Is it to increase income or cover cost or discourage consumption of certain items? There is need for clarity of price policy. In regard to wages there is need for a consistent policy between various official bodies—the Planning Commission, the Pay Commission, the National Wage Board which are now working in isolation. (11) There is need for a further spatial disaggregation of the model. Whether or not the States can develop their own input-output models, they must develop production tables so that there can be some micro checking of the aggregates in the Final Plan. (12) There are similar issues in connection with the assumption of reduction of imports in the preferred variant (what are the details of the Rs. 6,00 crores import reduction), the assumptions behind the export figures including export of of the luxury goods sector, the details of the policy instruments some of which like indirect taxes and a more certain industrial policy which should have been built into the model. All this points to the further short term and long term work that the Union Planning Commission, the State Planning Commission and the economists in the academic world are required to undertake. The Fifth Plan proposed outlay of Rs. 51,000 crores is being reviewed by the Union Planning Commission to take into account the performance of the economy during the Fourth Plan, including the effects of the inflationary spiral and the changes in the international monetary situation. Broadly the Fourth Plan will end with surpassing the financial targets—(against the public sector target of Rs 15,900 crores, the actual expenditures including the 1973-74 budget provisions will be Rs. 18,027 crores —Rs. 10,846 crores by the Union Government and Rs. 7,181 crores by the States), while there will be serious shortfalls in in physical performance. Against the target of annual average compound rate of 5.6 per cent growth of the national income, the actual rate is 3 to 3.5 per cent. The real value of the Rupee has fallen from 46.7 per cent at the start of the Fourth Plan to 39.2 at the start of the Fifth Plan, the price rise ranging from 3.7 percent in 1969, 5.5 in 1970, 4 in 1971 to 7.8 in 1972. Deficit finances targeted for the Fourth Plan at Rs. 850 crores have been doubled. Against the Fourth Plan target of 125 to 129 million tonnes of food grains, the 1972-73 achievement will be 100 million tonnes. Industrial growth targeted at 10 per cent is 7 per cent for 1972-73, with serious shortfalls in the core sector of steel and fertilisers. On the non-Plan side drought and flood relief to the States amounted to Rs. 633 crores and the special accomodation to the States exceeded the target of Rs. 800 crores to Re. 1,041 crores. Against the additional resource mobilisation Fourth Plan target of Rs. 2,100 crores by the Centre (net of States' share) and Rs. 1,098 crores by the States, the Centre would have raised Rs. 3,150 crores (well above the mid-term appraisal of Rs. 2,630 crores) and the States Rs. 996 crores. (Incidentally the share of direct taxes in the total tax revenues of the Union Government has declined from 24.5 per cent in 1967-68 to 20.6 in 1972-73, with 1973-74 registering the highest amout of taxation in a single budget year at Rs. 292 crores). The total market borrowings for the Plan targeted at Rs. 900 crores will actually be Rs. 1,485 crores. The small savings target first fixed at Rs. 769 crores, later revised to Rs. 1,000 crores will amount in collections to Rs. 1,050 crores. It is against this record of Fourth Plan targets and performance, that rhe Planning Commission is undertaking a fresh exercise of estimating resources for the Fifth Plan, and the estimated Rs. 3,000 crores balance of payment gap, taking into account the 10 per cent wholesale price rise in 1972-73

over 1971-72 (the approach paper computations were based as at 1971-72 prices), the Rs. 100 crores scheme this year for educated unemployed, the third pay commission's recommendations, the revision of salaries and allowances in the States, the takeover of wholesale trade in wheat and rice, the resource position of public financial institutions, the revised National income estimates for the Fourth Plan, the gross savings by the corporate and household sectors, and the international currency readjustments. The fixed points in the revision are the 5.5 per cent growth rate, zero net aid and the level of deficit financing for the Fifth Plan set forth in the Approach Paper. To attain these objectives how much more additional resources should be raised beyond the Rs. 6,615 crores estimated in the Approach Paper? Further work on the Fifth Plan includes the development of policies in relation to the objectives and targets set forth in the Approach Paper (see Vol. III pages 93-94) and the needed policy instruments. The Commission is at work on identifying the sections of the population on which restrictions on consumption standards are to be imposed, and the time schedule and time path for the imposition in order to create opportunities for increased production of consumption goods for the poor sections. Another area under examination is a special pattern of central assistance to ensure the realisation of the minimum needs programme under which the release of funds will be tied to particular schemes for the Rs. 550 crores drinking water scheme, the Rs. 1,200 crores for elementary education, etc. leaving otherwise intact the Gadgil formula for Central assistance to the State Plans. It is a matter of regret that this kind of tying which is contrary to accepted Union Government-State relations is necessary, particularly with regard to the anti-poverty programme on which there is unanimity. Other policies include measures for capacity use in industries and improved power generation. All these policies will be debated at the November NDC meeting by which time the Finance Commission will also have reported and the draft Fifth Plan readied (by September). Until the Finance Commission reports, there is a kind of standstill in the trends for State mobilisation of resources. As reported in Vol. III page 27, in addition to the deficit budgets for the current year presented to their legislatures by West Bengal, Rajasthan, Bihar and Mysore, Kerala presents a deficit of Rs. 12 crores, Pondicherry, Goa and Manipur Rs. 10 crores and Uttar Pradesh and Andhra Pradesh Rs. 40 crores. Legislation is being proposed to check tax evasion and tax black money. The RBI on its part is helping to increase the resources including the foreign exchange resources and the effectiveness of State Finance Corporations, extend commericial banks' credit facilities for all types of capital investment of the State Electricity Boards, particularly their rural electrification programmes and energisation of tube wells and pumpsets. It has also increased the net liquidity ratio of commercial banks from 36 per cent to 37 per cent and increased the terms for refinancing by 2 points, with a view to limiting credit to industries and reducing the pressure on prices. There will thus emerge a clearer financial picture for the Fifth Plan at mid point during the current fiscal year.

Pay Comm'ssion: The report of the Third Pay Commission presented to the Government at the end of March marks a series of important recommendations which will cost the Union Governmet Rs. 144.6 crores: (a) The minimum remuneration is Rs 185 per person at the start. The member-secretary of the Commission has however recommended a minimum salary of Rs. 196 on the com-

mission's *principles* of a need based minimum wage. Every additional rupee to the minimum wage will cost the Union Government Rs. 2.5 crores for those directly employed by it, excluding public undertakings and quasi-government establishments. On the evidence, the minority recommendation of Rs. 196 corresponds closer to the minimum wage criteria established by the 15th Indian Labour Conference. (b) Dearness allowance is to be merged with basic pay and the whole computed for pension purposes. This rationalisation is just and has been overdue. (c) The pay structure is related to 12 monthly index average of Rs. 200, with the payment of dearness allowance as and when the 12 monthly average of the index rises by 8 points and with variations as to maximum at different levels of pay. This again is a rational adjustment adapted to our conditions. (d) The disparity ratio between the minimum and maximum salaries after tax is reduced from 15.4 on 1 January 1970 to 11.8 on 1 January 1973 in accordance with equity considerations. (e) The number of pay scales is reduced and the structure simplified from 500 grades to 80, with an effective efficiency bar. (f) 10-25 per cent of vacancies in the junior administrative or IAS or Class I Officers are to be filled by outside recruitment as a means of infusing some fresh blood and outside talent in the services. (g) While a higher scale for IAS entrants is proposed, the present wide gap between the salaries of the administrative and technical services is narrowed -as it should in terms of modern management practices. (h) A common wage policy for public sector undertakings and a coordinating machinery to ensure this is proposed. (i) The age of retirement is to be continued at 58 years, the maximum qualifying service for pension 33 years, pension, gratuity, widow pension, the TA and DA allowances improved and rationalised and a Rs. 5,000 insurance cover provided. Working hours are to be increased by half an hour and holidays fixed at 16 days per employee. Wasteful expenditure due to overstaffing and inefficiency is to be reduced and productivity raised. (j) A permanent machinery for systematic collection of data on pay scales, fringe benefits, service conditions is recommended along with a standing body on pay and cadre management. These recommendations which cover 4 million Union Government employees, including a million defence personnel are being processed by a cell in the *Ministry of Finance* for establishment of the Government decision. The recommendations are broadly in line with the principles of salary and allowances fixation, taking into account the resource constraints and the general levels of living in the Country. They will inevitably have an inflationary effect but the counter to that is the programme to contain inflation outlined in Vol. III page 168 and 169 and 242 and 243 of the Bulletin, and not to hold back on the overdue action on salaries including the standing machinery proposals. These recommendations should also be seen in light of the interim report of the Union Planning Commission's expert committee on national wage policy. That policy is to ensure workers a minimum consumption of goods and services and a share in the growth and profits of industrial enterprises. The minimum wage is to be worked out on the basis of the Union Planning Commission's finding that in the Fifth Plan, the minimum per capita consumption can be met only by Rs. 40 a month at October 1972 prices and the total wage should comprise the minimum wage plus skill differential, compensation for exceptional hazards, growth dividends, dearness allowance and share in profits. The committee's interim report leaves out those dealt with by the Pay Commission and those in the unorganised and agricultural sectors and refers only to

the 10.7 million workers in the organised sector. For the implementing of the national wage policy, it recommends a National Wage Board to ensure wage fixation in all sectors in accordance with the national wage policy, to oversee the wage boards for specific industries, to recommend restraints in non-wage incomes, including those from property and enterprise. The committee also advises against constant increases in wages in the organised sector because labour in this sector is well above the poverty line and because of the burden in taxes and external loans borne by all the people in establishment of the key and the basic industries and the organised sector generally. The National Wage Policy needs to be extended to wages in the unorganised sector at which point the national wage board will have to be merged with a national wage policy commission.

Prices and grain takeover: The abnormal price rise analysed in the last issue of the Bulletin (page 242) continued in March and April contravening the hopes held out in the budget that the effect of the new taxes (see page 234 of the last issue) will be to the order of 0.4 per cent, and for the year around a mild 2 per cent. According to official statistics wholesale prices have gone up by 14.6 per cent in one year and food articles have increased by over 19 per cent. Retail prices have moved even faster and the price trend can be seen in the following price table:

Commodity		*Unit*	*12 months ago*	*Pre-budget*	*Current*
			Rs.	Rs.	Rs.
Cotton—Sankar 4	...	Candy	2,700/2,800	2,800/3,000	2,800/3,000
Yarn—Cotton 60s	...	10 lb	80/84	135/145	145/150
Steel—rounds	...	Tonne	1,740	1,760	1,820
Copper ingot	...	kg	16.40	17.20	19.55
Tin ingot	...	kg	48.25	57.50	59.50
Wheat	...	kg	1.25	1.15/1.30	2.25/2.50
Rice	...	kg	3.4	5/5	6/7
Bajra	...	kg	1.50	1.75	3/2.25
Gram	...	kg	2.75	3.15	3.25
Groundnut oil	...	kg 4	24	34.50	37
Coriander seed	...	kg	4	5.50	6
Chili	...	kg	6	7.50	8
Ginger	...	kg	12	13.50	14
Vanaspati	...	kg	5.50	6	6.25
Sugar	...	kg	2/2.25	3.70	3.70
Tea	...	kg	6.50/12	7/13.50	7.50/14
Milk	...	litre	2.30	2.60	2.80
Soap	...	12	7.50/10	7.75/11.75	8/12
Chappals	...	pair	8.25	8.50/19.50	10/30
Kettle	...	one	...	54/111	66/136
Mixer	...	one	...	240/425	295/525

It will be seen that retail prices have shot up impartially whether they be of items like wheat, rice, edible oils or ordinary cotton textiles, none of which were touched by budget imposts or those like steel, cigarettes, etc., which have been subject to new levies. The inflationary trend is due to a complex of reasons with particular reference to deficit financing and increased non-development expenditures. The Economic Times research bureau establishes in the following table a worrisome correlation between increasing money supplies, real national income and and the adverse effect on prices, given the time lag of one year for the effect of money supply to affect prices.

Percentage increase in

Year	*Average supply*	*Real National Income*	*Price level*
1966-67	9.3	1.5	13.9
1967-68	8.1	9.3	11.6
1968-69	8.0	0.7	-1.1
1969-70	10.5	7.3	3.7
1970-71	11.8	4.7	5.5
1971-72	14.0	1.5	4.0
1972-73	11.8	1.5	9.9

As the 9.3 per cent increase in money supply and 1.5 per cent increase in real income in 1966-67 led to a price rise of 11.6 in 1967-68 (the one year time lag), and as the rise in money supply since 1968 has been more than the rise in real income leading to excessive price rises, the lower relative money supply increase last year in relation to the rise in real income should mean that the price rise for this year ought to level off.

Of the four programmes to hold down inflation—lessening deficit financing, management of demand, increased agricultural and industrial production and improvement in the distribution system, the last, foodgrain take over began in April. On April 1, the Government take-over of wholesale trade in grain was initiated with the six wheat growing States —Punjab, Haryana, Madhya Pradesh, Uttar Pradesh, Maharashtra and Gujarat whose total rabi crop is estimated at 30 million tonnes—launching a massive procurement programme to purchase a total of 8 million tonnes and having arranged for their distribution through licensed and registered retail shops including cooperative stores, banned all wholesale trading. The first month of the takeover witnessed serious trouble and disruption in the process. The most serious were the April food riots and looting of grain shops in Nagpur and Nasik, the frequent bandhs in many towns in Maharashtra and the near break down of the rationing system in Bombay. Apart from the usual teething troubles due to administrative delays, transport bottlenecks (Maharashtra received the 18,000 tonnes of wheat promised at the end of March only at the end of April), there are more fundamental problems involved—the basic one being the Government not being ready to replace the wholesalers and the whole complex machinery that they represent. For the Country as a whole there are 10 million

traders who are supplied by half a million wholesalers. The actual marketing channels include (a) the village merchant, (b) the itenerant merchant, (c) the agent middleman who is the commission agent or wholesaler or wholesaler-cum-commission agent and who is the most important channel through whom 70 per cent of all sales of wheat, bajra, and jawar take place, (d) FCI and (e) cooperatives and retailers. Village merchants and itenerant merchants account each for 12 per cent of the marketed surplus, retailers and direct sales to consumers 2 per cent, and FCI accounts only for 1 per cent of the marketed surplus. In case of rice there is a further complication—the miller is an important middleman and the larger farmer who also owns rice mills and the mills constitute the major wholesale agency. Thus the first problem is that the Government takeover has to replace a wide and complex operation. A second problem is that the Government is starting by taking over only the marketed surplus whereas the wholesaler and the marketing channels were dealing with the marketable surplus. Out of the 30 million tonnes of the rabi wheat crop, 12½ per cent is deducted for seeds, wastage, etc., 40 per cent for consumption by the farmer, his family and labourers, leaving about 10 million tonnes as the marketable surplus. The Government's procurement target of 8 million tonnes leaves 2 million tonnes to be marketed in other ways. Further the percentage of production sold by farmer varies with the size of his holding. Those holding less than 5 acres are in deficit and buy from the surplus producers. Those with 5-10 acres are self sufficient but sell part of their product for their cash needs. It is the 10 acres plus holdings who have major marketable surplus—the 15-30 acres holdings have a 63 per cent surplus, the 30-50 acre holdings a 76 per cent surplus and the 50 acres plus holdings 86 per cent surplus. Thus the major part of the marketable surplus is in the hands of the large farmers who have no compulsion to market their product immediately and who can wait for prices to harden. The Government has to get this group of producers to market their produce and not to indulge in speculative holdings. One month after the rabi procurement began, only 1,21,000 tonnes of wheat had been procured—38,000 in Madhya Pradesh, 38,000 tonnes in Punjab, 21,000 tonnes in Haryana, 18,500 tonnes in Uttar Pradesh. The dangers of speculative holding back by large producers accounted for the last year's poor procurement in Haryana. Many wholesalers purchase wheat stocks from big farmers with whom the stocks were kept till they could be moved out of the State and sold in Delhi and Agra rather than in local mandis. This meant that out of 24 lakh tonnes of rabi wheat last year in Haryana, and the 11 lakh tonnes to meet internal requirements, only 9.75 lakh tonnes came on the local market, pushing up prices, and evading payment of various taxes and fees. Thus a good crop does not necessarily mean increased market arrivals. For this the Government must plan and act. It is the small farmer who is ready to sell but to get his produce the Government agencies must go to him as the commission agent and the itinerant merchant does and not wait for him to come to the market. The third and most serious problem faced by the Government is on the distribution side. In procurement it already has a deal of experience and now must improve and extend its operations to meet the 12 million tonnes target agreed at the Chief Ministers conference. On distribution there is need for a whole new structural set up. Nearly 16 million people are covered by statutory rationing and 395.7 millions by informal rationing. The total offtake of wheat under the public distribution system last year was 6.6

million tonnes. It will have to be more than double that this year and must be matched by a distribution network, if the wholesale takeover is to work. Here the present position is depressing. In Bombay which has been at the heart of the unrest, the 1,880 fair price shops simply cannot replace the 10,000 retailers who cater to 75 lakhs of people. The 300 cooperative stores entrusted with distribution of superior quality of wheat, to 12,000 units are in a jam and face long queues. The first come first served basis must be replaced by speedy and equitable distribution of available stocks. And then there is the price problem for both the retailer and the farmer. The price is already heavily subsidised by the Government but does not give a sufficient margin to the retailer and return to the farmer. The FCI purchases wheat at Rs. 76 per quintal and issues it at Rs: 78 per quintal. The real cost to the Government is Rs. 101.9 per quintal when the procurement, storage, movement and buffer stock charges are added. This is a heavy burden on the Government and it has ordered that the retailer sell at the same price as the fair price shop. It looks as if both the prices —certainly the issue prices will have to be raised. On the whole, the Government actions on the procurement side are improving. There is its threat to import wheat to break the log jam of speculative holdings and increase the buffer stock which in April was 1.5 million tonnes. It has raised the purchase price of nine varieties of better quality wheat to Rs. 82 and it has allowed some inter-district movement. Nine wheat specials containing 1.44 lakh tonnes have been rushed to Maharashtra. The equivalent actions must be taken on the distribution side to ensure the orderly functioning of this important area of economic life. The fall in wheat prices in Haryana, Punjab, Himachal Pradesh and Delhi must be generalised and ensured for the whole Country and for this the channels of trade must function smoothly.

National Production Front

Industrial growth: But for the effects of the power cut and the continuing shortage of industrial raw materials, industrial growth prospects for 1973 are positive. The 1972 rate of growth of 7.3 per cent (compared to 2.9 in 1971 and 4.8 in 1970) referred to in the last issue of the Bulletin (pages 238 and 239) was mainly due to the improved performance of cotton textiles, transport equipment and basic industries output. Another factor was the better utilisation of capacity, particularly in the last 2 years. In a survey of 1960 industrial units, two thirds report 60-90 per cent capacity utilisation, compared to 57.9 per cent of the units in 1970 and 54.5 per cent units in 1971. Hence underutilisation has declined. Industries operating at 40-60 per cent fall from 26 per cent in 1970 to 23 per cent in 1971 and 16.5 per cent in 1972 and those using only 20 to 40 per cent of their capacity declined from 18.7 per cent in 1971 to 17.9 per cent in 1972. Chemical industries increased capacity use from 62.4 per cent in 1971 to 71.0 per cent in 1972, glasss industries from 66 per cent to 78.5 per cent, leather industries from 73.3 per cent to 83 per cent. This factor alone may result in an 8 per cent industrial growth rate in 1973, while the Fifth Plan target of 10 per cent will require that the present 70 per cent average capacity utilisation increases to 90 per cent. In real terms, the growth of large scale industrial units increased from 6.4 per cent in 1970-71 to 8.1 per cent in 1971-72, with the larger houses growing less fast than the large units. This improvement needs to be continued into this year and the Fifth Plan. Total capital raised by the private

sector companies increased from Rs. 66 crores in January-September 1971 to Rs. 101 crores in January-September 1972. Total plan outlay on industry for 1972.73 was Rs. 799 crores which was an over 10 per cent capital increase. IDBI assistance was stepped up from Rs. 94 crores to Rs. 152 crores, and capital imports approvals were over Rs. 114 crores for 10 months in 1972 compared to Rs. 101 crores for that period in 1971. 877 letters of intent and 563 industrial licences were issued in 1972 and 256 foreign collaboration agreements signed. The 1973-74 outlay is aimed at producing 7.8 million tonnes of steel ingots, 2,10,000 tonnes of aluminium, 1.4 million tonnes of nitrogen and 4,00,000 tonnes of phosphoric fertilisers, 40 million tonnes of iron ore, 80 million tonnes of coal, 7.8 million tonnes of crude petroleum, 20.5 million tonnes of petroleum products and 18 million tonnes of cement. The achievement of these targets will be a good indicator of the industrial growth path for the Fifth Plan.

Public Sector Performance : The performance of the public sector which is of decisive importance shows improvement in the report for 1971-72, though 93 of the units incurred a net loss of Rs. 19 crores against the Rs. 3 crores loss in 1970-71. But 70 per cent of them show an improvement in their net profit for 1971-72. For that year 45 units made a profit of Rs. 99.7 crores compared to 44 units who made 72.5 crores in 1970-71. 31 of them improved their profits so that both the number of firms and profitability have moved up. The main improvement is shown by IOC, Bharat Electronics, ONGC, Shipping Corporation and ITT. The major losers are Hindustan Steel, Heavy Engineering Corporation, Neyveli, Indian Drugs, and MAMC. Unusually Air India joined this losing group, recording a loss of Rs. 1.66 crores in 1971-72.

Steel : Steel production in the Country presents a series of inter-related issues. First last year's (1972-73) production exceeds six million tonnes, with the three HSL plants producing 4 million tonnes of steel ingot. This is good and is an improvement over the 67 per cent capacity production of the past 3 years, with last year's capacity use being 60 per cent. In this good performance, Bhilai leads with 81 per cent capacity use at 2.1 million tonnes of ingot, followed by Rourkela producing 1.17 million tonnes against a capacity of 1.8 million tonnes. Durgapur produced 7,23,000 tonnes against its one million tonnes capacity. Second the Target for this year 1973-74 of 7 million tonnes, including 4.55 million tonnes for the HSL plants which is 77 per cent of rated capacity will be achieved as they are producing now at this level. TISCO is producing at its high level of 85 per cent capacity of 2 million tonnes and IISCO at a little over 44 per cent at 0.44 million tonnes, compared to its 1 million tonnes capacity. Third the 3 HSL plants have incurred a loss of Rs. 25 crores for 1972-73 which is much lower than that for 1971-72 at Rs. 45 crores. Their cumulative loss amounts to Rs. 594.37 crores against their equity capital of Rs. 594.37 crores and long term loans of Rs. 416.70 crores. The losses are due to underutilisation of capacity, the effect of capital charges, cost escalation and disturbed industrial relations. The reduced losses last year are due to the repair to the coke ovens, use of alternative fuels, improved maintenance, speedy capital programmes and improved industrial climate at Rourkela following from the reward scheme and the Durgapur joint consultation machinery for resolving industrial disputes. Fourth the shortages in relation to demand are high and will be higher this year. Steel imports in 1970-71 was 7,00,000 tonnes at Rs. 150 lakhs, in 1971-72 1.3 million tonnes at Rs. 250 lakhs,

and for 1973-74 an estimated 1.5 million tonnes which with rising international prices and unavailability of steel internationally except from Japan and some of the socialist countries will cost more than Rs. 350 lakhs. In fact international prices of cold rolled coils is Rs. 3,000 per tonne compared to Rs. 2,000 domestically, of hot rolled items at Rs. 1,500 compared to Rs. 1,300 and merchant bars Rs. 2,000 and Rs. 1,000 respectively. Japanese prices have gone up by 50-80 per cent in the last year. Hence it is urgent to increase domestic production and decrease the gap between production and demand. In this connection the contrast between Japan which without any of the needed raw materials has increased its production from 1.7 million tonnes in 1948 to 93 million tonnes today, and India with plentiful supplies of iron ore, coal, limestone and labour has increased its production from 1.3 million tonnes in 1948 to 6 million tonnes stands in sharp contrast and calls for a long term plan to make maximum use of our endowed resources. Fifth in this situation the proposal to the zonal system of steel distribution made by the Steel Study Group of the Union Government should not be acted upon. It would seriously affect steel availability in the South, will increase the price of steel in this State and will seriously hamper small industrial units. Finally there is the problem for the Fifth Plan. By the end of the Fifth Plan the domestic demand for saleable steel will be 13.50 million tonnes plus an export demand of 1.8 million tonnes (a total of 15-16 million tonnes) and, if 90 per cent capacity use is assured, calls for an installed capacity of 17 million tonnes of saleable steel and 22 million tonnes of ingot against the present 8.9 million tonnes capacity (Bhilai 2.5 million tonnes, Durgapur 1.6 million tonnes, Rourkela 1.8 million tonnes, TISCO 2 million tonnes and IISCO 1 million tonnes). The expansions which are firm are 2.5 million to 4 million tonnes for Bhilai and 4 or 4.7 million tonnes for Bokaro. The first gap between the present installed capacity of 8.9 million tonnes plus the firm decision of 6.2 million tonnes for Bhilai and Bokaro and the needed capacity of 22 million tonnes, which is an additional new capacity of 7 million tonnes can be created by adding a further 3 million tonnes to Bhilai and an additional 4 or 5 million tonnes to Bokaro or by increasing TISCO by 2 to 2.5 million tonnes and plan for 2.6 million tonnes each from the Vijayanagaram and Vishakhapatnam Steel Plants. In fact if the Government chooses to expand Bokaro to 10 million tonnes and Bhilai to 7 million tonnes, the expansion plans of TISCO, Durgapur and Rourkela as well as the establishment of the Vijayanagaram and Vishakhapatnam Plants will be in serious question. The choice will depend on the desirability or otherwise of placing main reliance on two giant plants, Bhilai and Bokaro, and on one country's (USSR's) assistance along with the prolems of power supply faced by Madhya Pradesh to the enlarged plant and the railway density map which will be called upon to carry over 45 million tonnes of coal per year to operate Bokaro at 10 million tonnes. There is also the expectation of the 2 Southern States. The second issue is that even the 22 million tonnes capacity target, will not meet the demand for steel set by the Fifth Plan targets. From that point of view there may be place for the Bokaro Bhilai expansion and the erection of the Southern Plants—which can break even at only 2 to 2.5 million tonnes capacity each and for which there will have to be heavy import of equipment and machinery.

Fertilisers : 20 fertiliser plants with a total capacity of 2.87 million tonnes

nitrogenous and 1 million tonnes of phosphatic fertilisers are under production or construction. The annual consumption of plant nutrients in the Country is 20 million tonnes and there is a wide and growing gap between fertiliser supply and demand due in the main to supply not keeping up with the increased demand caused by the larger fertiliser doses being used by the farmer for cash and food crops, the crash rabi programme, the delay in operating the Zuari Agro Chemicals and FACT plants, the effect of power cuts on the Punjab, Uttar Pradesh and Andhra Pradesh. Pending increased production and the setting up of new plants, the efficiency of fertiliser application which is now 50-60 per cent can be increased by some further care in transportation, storage and application in the field. This together with some form of control over distribution such as instituted in this State is our urgent need. Such savings are in any case needed because the Planning Commission projections are of a frightening gap of 4 million tonnes at the end of the Fifth Plan, against a demand for 5.2 million tonnes per annum of nitrogenous and 2.1 million tonnes of phosphatic fertilisers which will near double by the end of the Sixth Plan. It is to close this gap that Engineers India Limited (EIL) has formulated proposals for building quickly with the maximum indigenous equipment 5 plants (see Vol. III page 174). Toyo Engineering, Mitsubishi, and Hitachi of Japan as well as 4 UK, Italian, Spanish and French firms have offered their help in establishing these plants. These five plants will have a total capacity of 1.34 million tonnes of nitrogenous and 0.51 million tonnes of phosphatic fertiliser per annum. In this connection it may be noted that the value of one year's production of a nitrogenous fertiliser plant is about the same as the foreign exchange needed to build it, or the cost of fertiliser imports for a year—each of which amounts to Rs. 160 crores. The need now is for economic and efficient use of fertilisers by the farmers and quick action on building and operating the new plants.

Petroleum: Further to the petroleum problems outlined in Vol. III pages 15, 97, 175 and 246 of the Bulletin, all 3 foreign companies — Esso, Caltex and Shell are now refining Iraqui crude which at first they had refused to handle. The 3 companies are refining 50,000 tonnes at their refineries in Bombay, Vishakhapatnam and Madras, IOC is also expanding the Koyali refinery to 7.3 million tonnes from the current 3.6 million tonnes at a cost of Rs. 28 crores including a foreign exchange component of Rs. 7.67 crores. Further the Government is proceeding with its offshore drilling and exploration programme and finalising the outright purchase of Esso and the phased takeover of Oil India, a Government-BOC firm—as a means of meeting the demand for crude and petroleum. In this connection the exploration concession obtained in Iraq and the agreement to trade our goods against enlarged crude supply from Iraq are further means of meeting the future needs of the Country, without being continually pressed by hardening international markets.

Sugar: On the basis of the Tariff Commission's final report recommendation for an increase in the levy price of sugar by Rs. 20, the consumers will have to pay 20 paise more per kilo, and the open market price of Rs. 4 will also go up, if the Government accepts the recommendation. The last 20 paise increase (see Vol. II No. 11 page 14 of the Bulletin) was aimed at contributing 14 paise towards the minimum price of Rs. 8 per quintal to the cane grower and 6 paise towards increased minimum bonus payments. The produ-

ction of sugar is expected to be 36 lakh tonnes, which will yield a carry over stock of 5.87 lakh tonnes. The proportion of levy to free sale sugar is 70 : 30. This means that about 12 lakh tonnes will be sold in the open market at Rs. 4 per kg and on 40 lakh tonnes (36 lakhs production plus 4 lakh carry over) the mills will be earning a large sum of Rs. 260 crores for this year. This rather than the problem of the sick sugar mills accounts for the current debate over the Government take-over of sugar mills. The committee which is examining the matter will soon be reporting. To forestall any such move the Indian Sugar Mills Association has proposed to the Government that it plans to levy a cess on a progressive slab basis of 25 paise per quintal for the first 10,000 tonnes on to Rs. 1 per quintal for larger amounts. The cess will not be passed on to the consumers and the resulting fund of Re. 1 crore will be used to run all the sick mills including the 15 mills now being run by the Government, providing the needed finance and managerial and technical personnel. The proposal may have come a little late and its payoff must be weighed against the proposal for the Government takeover of the industry.

Other industries : Quality control badly needed in so many lines of production is being introduced in the motor car industry through random checking of the assembly lines and ISI specification and/or certification of the various components. At present, of the 40,000 cars produced, 4,000 are used as taxis. The Government proposes to increase this number to 14,750 plus a further 2,250 for self employed matriculate taxi drivers. So too for the last year, scooter production amounted to 61,000 and for next year it is to be expanded to 1.5 lakhs and to 3 lakhs by the end of the Fifth Plan. The Hindustan Tractors, Baroda, is being taken over by the Government as it is producing 500 tractors against the licensed capacity of 7,000. It is also proppsed to reduce the customs duty on imported components of tractors and waive the excise duty on indigenous tractors with a view to increasing the demand. This decline is also due to other factors such as the uncertainty caused by land ceiling, drought, delayed loan approvals, tightening of credit and cumbersome procedures. More tractors are being allotted to agro-industries corporations to enable them to rent them to small farmers and so stimulate both demand and production. The Heavy Engineering Corporation closed last year with a reduced loss of Rs. 14 crores (a cumulative loss of Rs. 100 crores) but both HEC and MAMC are being toned up to break even this year. The Central Engineering and Design Bureau has been reorganised as the Metallurgical and Engineering Consultants Limited (MECON) with a capital of Rs. 4 crores and is a subsidiary of SAIL as its main function is to design the expansion of Bokaro and complete the feasibility studies for Vijayanagaram and Vishakapatnam. It has also designed the smelter and fabrication facilities for the giant public sector Aluminium Complex at Korba with an estimated investment of Rs. 152 crores. In April the Korba complex started the production of 2 lakh tonnes alumina—which provides the intermediate material for producing 1 lakh tonnes of aluminium. The plant employs 8,000 persons and was constructed with Hungarian collaboration in 42 months and 90 per cent of indigenous machinery. Aluminimum is a major metal produced in the Country, which ranks 9th among its world producers. The National Research Development Corporation is another such undertaking which is developing slowly but on right lines. Out of a total of 1,042 inventions registered with it between March 1954 and December 197?, 415 have been licensed with royalty and premium and 122 released freely. About 50 per

cent of its licenses (210) and 20 per cent of the inventions are in production. The total value of production of these processes is Rs. 43 crores, including foreign exchange savings of Rs. 33.75 crores. This is admittedly a small proportion of our total production and technology imports but the 1971-72 report shows that it made a profit for the first time and is now well on the way to pay off its accumulated losses of Rs. 36.4 lakhs. It is now working not only on development of indigenous technology but even more important the use of the available technology. There is a vast amount of imported technologies on which all public sector enterprises have been built and these together with those with the private sector provide enough know-how to be further adapted and made available to the new entrepreneurs. That is the main task a waiting the NRDC, together with providing the guarantee or risk capital to entrepreneurs, a more active funding of pilot plants and prototypes for all of which it should be given the funds.

Agricultural production : As forecast in the last issue of the Bulletin (pages 246 and 247), the rabi wheat crop is likely to be 30 million tonnes, being an increase of 3½ million tonnes over last year's rabi crop. This means that food production for 1972—73 will be 100 million tonnes against the production target of 108 million tonnes and the 1973-74 target of 115 million tonnes can be achieved, if the rains are normal. Despite the obstacles of power cuts and shortage of fertilisers (see earlier section), 1.5 million hectares of additional land were brought under food production programme and the emergency programme has now been built into the normal food production effort so that the base for the future is expanded. Now it is important in the interest of maintaining this stable base and building future production expansions on it, for the buffer stocks of food grains to be sufficiently increased and the cropping patterns in irrigated areas as well as in dry land farming to be restructured and the second generation problems of storage, marketing, and pricing to be effectively dealt with. In this connection the loss of foodgrains due to rats, insects and spoilage is really inexcusable. The Mysore Food Technology Institute computes that our rat population of 2,400 million which could be controlled by a campaign, consumes the food of 400 million people (making the Country's population 900 million in effect), that moisture and insects which can be controlled by proper use of solar drying further reduces our food grains. Given the fact that over 45 per cent of the land area is under cultivation, further improvements in food production calls this year for reclaiming the 7 million hectares of saline and alkaline soils, increased productivity through genetic manipulation of the yield potential of various crops and an efficient land and water use technology for each ecological area. For this year the new cropping patterns provide for drought resistant strains which together with appropriate tillage, moisture conservation, crop and varietal choice, fertiliser application and plant protection will increase yields by over 50 per cent. Another simple practice is to advance the sowings in the Deccan rabi areas by a couple of months in order to use the existing moisture and profit from the October rains. For semi-and flood prone areas both new cropping patterns and drought or flood resistant rice or wheat plants can be used. Fifth Plan proposals to increase land brought under irrigation from 1 million hectares per annum which has been the average rate from the First Plan to the Fourth Plan to 2 million hectares a year would mean that out of the total cropped area of 164 million

hectares, 54 million hectares would have irrigation facilities. A further Fifth Plan programme is the Rs. 15 crores scheme to lime the soil in 7 States in order to increase food production, in some cases by as much as 100 per cent. For the 7 million hectares of acid soils in the Country, a very cheap and potent source of lime is the basic slag, a by-product of steel mills which is currently classed as waste. (Here there is a competitive use of slag as between agriculture and building construction (see rol in page 164), for which a cost-benefit analysis may be used to decide which use has the higher pay off. With the one million tonne of basic slag, using 2 tonnes per hectare, 500,000 hectares of acid lands can be limed and their output doubled. For this year's sowing there will be a problem of fertilisers and seeds. The crash rabi programme of last year has involved heavy use of both. The reports of the agricultural ministries—Union and State, the community development programme and the cooperatives confirm this trend. The CD report refers to the increased distribution of fertilisers by over half a million tonnes and of pesticides by over 10,000 tonnes compared to the past year. Per block the distribution of seeds was 1,570 quintals compared to the previous year's 1,200 quintals, fertilisers 15,760 quintals compared to the previous year's 14,027 quintals and 134 quintals of pesticides compared to the previous year's 108 quintals. Action must now be taken to import, if necessary, seeds and fertilisers for the next cropping season. So too cooperative credit for short and medium loans to farmers moved up to Rs. 601 crores in 1971-72 and Rs. 690 crores in 1972-73 and long term loans of Rs. 178 crores and Rs. 190 crores. But in this whole programme the rate of arrearages is steadily increasing due to defective loan policies and operational and managerial procedures, which quite apart from the drought and power cut causes, persist and must be corrected. Another area needing attention is the proper use of what is called animal husbandry waste, such as the 99 per cent of the 27,000 tonnes of animal intestines which are thrown away instead of being exported, the two thirds of the 55,000 litres animal blood which can be used as stock feed but now thrown away, the wastage in the 12 million carcasses, etc. In all the annual Rs. 30 crores loss on this account can be reduced by use of the waste product, starting from this year.

Land Reforms : Further to the earlier reviews of land ceilings legislation and land reforms (see Vol. II No. 6 pages 8 and 9, No. 7 pages 5-8, No 8 pages 10 and 11), the Union Planning Commission has undertaken a State by State review of the situation of land reforms and agrarian relations. (1) There is need for speedy implementation of the legislation to abolish intermediary tenures in Andhra Pradesh, Gujarat, Jammu and Kashmir, Maharashtra, Mysore, Orissa, Himachal Pradesh; (2) tenancy rights have to be protected, security of tenure ensured, tenancy rights recorded and conferred, rents controlled and the purchase of lands by the tenants promoted in Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Jammu and Kashmir, Kerala, Madhya Pradesh, Maharashtra, Mysore, Punjab, Rajasthan, Uttar Pradesh, Himachal Pradesh—in other words in all States except Tamil Nadu and West Bengal; (3) land ceilings should be revised and their implementation expedited in Andhra Pradesh, Bihar, Kerala, Orissa, Uttar Pradesh, West Bengal, Manipur and Tripura; (4) the position of share croppers scheduled castes and tribals in cultivation and ownership should be safeguarded in Assam, Bihar, Madhya Pradesh and West Bengal; (5) consolidation of holdings

particularly in irrigated areas should be promoted by legislative action in Andhra Pradesh, Bihar, and Tamil Nadu. The National picture is depressing and shows that what is wanting in this area of social justice and increased productivity is the political will. The report shows the widening gap between promise and performance, legislation and implementation, policy pronouncements and actual execution and large, continuing and in some cases contrived loopholes for evasions and benami transactions. This is the first correction that should be made—the generation of the will to reform. Second the inequity of the agrarian situation is not only the continuing inequitable distribution of land ownership and the unprotected position of tenants, share croppers, tribals and scheduled castes, this must be righted by legislation. Of the Rs. 2,000 crores invested in irrigation, the benefit has accrued to large land holders who have contributed nothing to the public exchequer in return. Whether this should be corrected by a progressive, betterment levy on all irrigated lands above 50 acres or through the Agricultural Holdings Tax (AHT) should not be used as an occasion to delay correcting this inequity. The AHT is the preferred comprehensive levy but till it is discussed at the NDC and accepted by the States the betterment tax can be immediately levied. Third the ceiling laws should be enacted and implemented within a 12 month period. They should not be justiciable and the issue should be settled in specially constituted tribunals. Fourth consolidation of holdings should be pushed forward both by State farms and by legislation. The establishment of the first 532 hectare collective farm at Illithode in Kerala in which 250 landless families (including 50 per cent Harijan households) who have formed a cooperative, each paying Rs. 25 per week is of interest to the whole Country. With a Rs. 5 lakh capital, the collective will make Rs. 3 lakhs loans for cultivation, Rs. 1 lakh for equipment purchase and Rs. 1 lakh for housing. Kerala is planning 2 more such collectives. Fifth there is need for financing land reforms in the Fifth Plan, finances which are needed not on a large scale, and an organisation like the revenue administration set up. In this State, as pointed out earlier, what is needed is a comprehensive law putting together the separate pieces of legislation and more speedy execution.

Exports and Imports : The revised import policy which went into effect in April is aimed at stimulating further industrial growth. Its procedural simplification and rationalisation for the import of capital goods, the issue of advance licenses for the import of samples, the abolition of the nonavailiability certificate for steel, the import of technical and science books by both STC and other private traders and the authorisation of small scale units to form consortia which will be treated as export houses are much needed reforms. Further 20 additional items from copper pipes and tubes to raw petroleum, coke and ships for scrap have been added to make 202 items which can now be imported through public sector agencies. In view of the growing variety of domestic production, 220 items have been taken off the import list and the import of 81 items from ball bearings to drugs has been banned. The encouragement to small scale units in backward areas and those started by qualified engineers for a 50 per cent increase in the import of machinery and raw materials is a further gain. Firms which double their exports can increase their imports of nonpermissible items from 5 to 10 per cent, so that their export performance also ought to improve. In view of the tyre scarcity in the Country,

22,000 tyres are to be imported by Telco and STC and their distribution brought under the Essential Commodities Distribution Act. On the export front, the export of electrical machinery is steadily increasing at Rs. 16.1 crores in 1970-71, Rs. 18.7 crores in 1971-72 and an estimated Rs. 25 crores in 1972-73. Vacuum flask exports are also increasing to Germany, France and Japan at a rapid rate. Engineering exports on the other hand have been lagging and the NIDC is enquiring into the causes and proposing increased capacity use and new and improved methods of production. The export of goods in mass demand like sugar and edible oil have been declining and in time the exports of the luxury sector should be further increased. While on the whole the export performance for 1972-73 is satisfactory at Rs. 1,760 crores, attaining the target of 7 per cent growth and a favourable trade balance of Rs. 151. 56 crores with the STC doubling its exports to Rs. 188.2 crores, this is being achieved at the cost of considerable losses in the individual 150 items, the majority of which are being sold below cost. Similarly the proposal to export 10,000 tonnes of natural rubber at a loss which is smaller than the cost of STC stock piling rubber along with proposals to increase STC and State Government holdings are similar negative elements. Again India's poor export performance in the EEC market and failure to take advantage of the GSP, despite its limitations (see Vol. III page 249) is a fact. Even in the case of items on which there are restrictions, like travel goods of which $4,34,000 was imported by EEC countries last year, India's share being only $35,000, or carpets in which India has a large comparative advantage but in which India's share was 9 tonnes out of 7,000 tonnes imported by EEC in one variety, 14 tonnes out of 14,000 tonnes in another variety, dolls in which India's share was $ 1,500 out of a total imports of $ 2.8 millions. One reason is the kind of interminable delays in obtaining industrial licenses for import of the needed machinery, chemicals and dyes needed by the leather industry to meet its large demand for finished leather. Similar restructuring is needed to step up exports to EEC and Japan of engineering goods, cutlery, sports and racing cycles, multi speed jubs, etc. Without exaggerating the benefits of GSP as operated by EEC whose limits were discussed in the last issue, India can perform better all along the export line — in consumer goods, consumer durables, intermediate goods and capital goods, if we can improve our competitive capacity and our rules and regulations can be related to the needs of the exporting centres. As forecast in the last issue (page 248–249), the EEC council of foreign ministers have authorised its executive to conclude a five year trade agreement with India which is simply putting into a single document the existing bilateral agreements of India with the EEC countries. This editorial achievement involves (a) incorporating the accords on cotton textiles, jute, coir and other goods previously concluded between EEC countries and India, (b) consolidating the tariff reductions granted by EEC on small items like tea and pepper, and (c) including all bilateral trade agreements between the 2 sides. This is useless in relation to the heavy adverse trade we have with these countries. The only new element is the formation of a mixed commission to supervise the agreement and suggest means of increasing trade. This seems now a lost cause and India needs to develop her markets in the third world – Asia and Africa, as well as in Japan, Australia and New Zealand, USA and the socialist countries. The problem is to compensete for heavy losses that will

be suffered from January 1974 when from January 1974 the Indo-UK trade will come under the EEC tariff. The real answer is to increase the attractiveness of our exports. As far as the third world trade is concerned, the India-UAR-Yugoslavia tripartite agreement which has been renewed has pluses and minuses. Its gains are that it expanded trade between the 3 countries in non-traditional items, promoted joint ventures and infrastructures. India's exports to UAR doubled and with Yugoslavia more than doubled. The negative elements are the trade imbalances created in the competitive economies. There is every reason to persist with this intra-third world trade relationship. In this regard the 37 Indian industrial joint ventures plus another 62 being developed in other countries are an important instrument, involving an investment of Rs. 7 and 10 crores and earnings of Rs. 1 crore. Trade with US may be further expanded with agreement to purchase sophisticated railway equipment from the US firms with the US-IDA resources, following from a recent mission of 15 US businessmen.

Aid: The US Government in mid March lifted its aid embargo on India and so the Rs. 67 crores ($87 millions) held up in 1971 is now available. In 1972-73 there was one US project aid agreement signed between the 2 countries for $21.95 millions and a debt relief accord for $29.12 millions. The visit of the US railway team followed the resumption of US aid to the Country. The Government has to pay before 2012 A.D. to the US Government Rs. 1,501 crores towards PL 480 loans. Rs. 611 crores of this amount are repayment of PL 480 and non PL 480 loans and interest on US-Rupee funds which are held as special securities in the Reserve Bank. 314 crores are held under PL 480 convertible local currency credits repayable in dollars over 40 years. Negotiations are now under way between the 2 governments to settle the repayment and liquidation of this large debt. For 1973-74 the government expects under foreign aid Rs. 661.8 crores, including Rs. 188 crores as new credits. IDA will provide Rs. 222.36 crores, Soviet Union Rs. 20.12 crores, UK Rs. 49.62 crores, Japan Rs. 49.07 crores and Canada Rs. 37.61 crores. Negotiations have been completed for a World Bank credit for Rs. 62 crores for power projects in Assam, Kerala, Madhya Pradesh and Delhi. UK also signed in March an interest free loan agreement for Rs. 9, 484 crores to cover import from Britain of non-project goods, and a second Rs. 6.6 crores loan agreement for purchase of raw materials and spare parts. The Dutch Government has also signed two agreements for Rs. 15.25 crores (general purpose) and Rs. 5.61 crores for large value projects. The World Bank is planning to propose gross aid of $1, 250 millions to the Aid India consortia for 1973-74-the last year of the Fourth Plan to cover project aid, non-project aid and debt relief. The Indian foreign exchange position is tight with a Rs. 33 crores decline to Rs. 815.8 crores. For 1972-73 the gross aid agreed to was $700 millions for non-project aid and debt relief and $550 millions for project aid. Actual aid in 1972-73 was around $1 billion. Taking the aid committments for 1971-72 (Rs. 929.2 crores) and for 1972-73 (Rs. 670.9 crores), the average of Rs 800 crores is a near doubling of the 1969-70 aid of Rs. 447 crores. But the increase in debt servicing has meant a steep decline in net aid from Rs. 444 crores in 1969-70 to Rs. 123 crores in 1972-73. At this rate the net aid will reach zero by 1978-79. The 1973-74 budget assumes aid utilisation of Rs. 661.80 crores against Rs. 626 crores in 1972-73, mainly because the debt servicing this year will be at a high Rs. 550 crores. Now attention is to be turned

more towards reaching a fair debt relief and settlement agreement with the donors and not further aid. This is all the more urgent as the real burden of our debts has increased with the revaluation of the Japanese yen and the European currencies.

Monetary changes and the debt burden: Due to the 11 per cent revaluation of the Yen from 360 yen to the dollar, India's debt to Japan has increased from $433 million at the end of 1971 to over $600 million in March 1972—without any further loans from Japan. Indonesia is even more seriously affected with a debt of 164 billion yen, (India's was 156 billion yen) followed by Pakistan at 72 billion yen and other Asian countries. The 3 per cent revaluation of the West German mark, and the parallel upward movement of the French, Belgian and Swiss franc have increased India's debt to these countries by a similar percentage. The question of debt relief and rescheduling becomes urgent in this context. In addition export agreements and export orders have been disrupted in sugar, cloth, tea, coffee and petroleum and their regulation will be a long drawn out affair.

International :

Bangla Desh: April saw two violent tornados sweep over the coast of Bangla Desh within a week of each other causing a loss of 1,000 human lives and doing considerable damage to infrastructure in the affected towns and villages. This adds to the urgency of the rehabilitation programme whith is now well under way. The Country faces a food grain shortage of 25 lakh tonnes against which the government is arranging to import 12 lakh tonnes at a cost of Rs. 160 crores in hard currency. This is a heavy drain on it amounting to three fourths of its foreign exchange earnings for 1971-72. The US promise of 1 million tonnes of wheat not having materialised, the Government is buying wheat in Australia, Argentina and the US and rice from Thailand. International wheat contributions have amounted to 16 lakh tonnes, leaving a gap of 9 lakh tonnes and a total shortage as mentioned earlier of 25 lakh tonnes which according to the UN survey are needed to supplement 100 lakh tonnes of domestic production. Only 10 per cent of this 100 lakh tonnes total is marketed, the rest being consumed by the rural people and the farm families. The Bangla Desh First give Year Plan was the subject of examination and discussion at a two day international conference of governments. The Plan calls for a foreign exchange assistance of $ 550 million. The conclusion of the inter-governmental discussion was that such developmental finance must be provided to the Country on soft and concessional terms, with particular reference to the food needs, agricultural development, project preparation and implementation and the balance of payment position; it was agreed that international aid to the First Plan should begin this year. Further meetings will decide on the terms and quantum. The 3 tier India-Bangla Desh trade agreement which ended on March 27 has been extended till June 27 in order both to clear up some arrears and provide the necessary time to negotiate a new agreement in light of the working experience of the first accord. That agreement which had to be concluded in some haste has faced a number of difficulties in implementation. The border trade section which was aimed at promoting the free exchange in vegetables, perishables and articles in daily use did not function satisfactorily and had to be suspended in October 1972 (see Vol. II No. 11 papes 20 and 21 of the Bulletin).

The section on exports to Bangla Desh for goods up to Rs. 25 crores has faced a series of shortfalls, mounting to Rs. 9 crores. Against the export target of Rs. 10 crores of tobacco only Rs. 7 crores were were actually delivered, against Rs. 4.5 crores of cement expected only Rs. 1.9 crores along with similar shortfalls in coal and asphalt. In the other part of the limited payments arrangements, namely the import by India of Rs. 25 crores worth of goods from Bangla Desh, the shortfall is even higher at Rs. 11 crores. Imports of fish have been Re. 1 crore instead of Rs. 9 crores, newsprint Rs. 2 crores instead of Rs. 3 crores and so on. Now that the immediate relief needs to Bangla Desh are over, trade between the two countries can be established on a sounder basis in items of mutual interest for the 2 countries such as fish, jute, newsprint, engineering goods, coal, textiles, tobacco, with preferential arrangements within the trade policies of the 2 countries and on the basis of free exchange. For this the various bilateral infrastructural arrangements and bodies should be strengthened and activised. The joint river commission in its four meetings has supervised the river route development especially on the Indian side and completed the joint aerial and hydrographic survey of the Ganga from Farakka to Gorai offtake. Similarly the joint power board (see Vol. II No. 6 page 15) is arranging for the supply of 10-15 MW power from the eastern grid of Bangla Desh to Tripura and Mizoram by providing links between Comilla and Agartala and the supply of similar power from the Indian side to western grid of Bangala Desh by linking Ashoknagar and Jessore. This should lead to long term projects to link the two countries' power grids, the development of Rooppur Nuclear power project in Bangla Desh and the hydro-potential of Meghalaya. Similarly on the transport side, the Bangla Desh order for 500 broad guage wagons valued at over Rs. 1.6 crores and the development of its road system are essential for trade expansion between the 2 countries. Bangla Desh needs 20,000 tonnes of coal valued at Rs. 4 crores per annum and the large coal accumulation at our pit heads make possible meeting this demand quickly and regularly provided Indian railways and Bangla Desh transports can be readied. Similarly the supply of Meghalaya limestone to the Chatak factory in Bangla Desh depends on additional railway lines that the joint commission must develop. Other joint ventures should include the setting up of automobile units and engineering goods plants in Bangla Desh to make it self reliant in these lines and in the long run develop its export potential in them.

Monetary crisis and monetary reform : Following the February dollar devaluation reported in the last issue (pages 251-253) and the serious upset in parities leading to renewed attacks on the dollar and the demand for the yen, the German mark and other European currencies, and the closure of the money markets, three short term measures were taken in March. The Mark, the Yen and other European currencies were revalued, The common market countries launched a joint float of their currency parities with the exception of the UK which could not join this joint limited floating effort without guaranteed backing by the other countries so that it may adhere to the limits. It wanted a wider floating margin and safeguards for the large overseas balances in the London money market. Ireland and Italy also continued their own floats. The US joined with 13 other countries in order to support the dollar and its new parities. The US agreed not only to intervene in the market to back up the dollar and trade one currency against another in support of the

floating parities; it also would take measures to attract capital back into the US, including the $3,000 millions on deposit in Europe. This is a difficult pledge to keep with $100 millions in Euro dollars with the European Banks and $268 billions as short term liquid assets of the multi-national corporations. But the basic causes for the crisis remain to be tackled. The float is no answer because it is based on a system of fixed exchanges of the common market currencies which do not correspond to the current economic and trading position of the countries. Apart from the UK and its dependent float, there is a basic contradiction between the strong and rising Mark and the weak and declining Franc. Between the members of the European Community, the exchange rates must first be fixed on the basis of their relative economic strengths. Second there is the problem of Japan whose economy and trading position is in conflict with Europe and US (see Vol. III page 252). Third there is the problem of the serious balance of payment position of the US and the current year is not likely to see any improvement in its payment deficit status. Its main deficit is with Japan which can be remedied only partially by intervening action of the two governments. Basically as long as the imports of the US from Japan are elastic in relation to prices and exchange rates while its exports of food grains and high technology goods are inelastic, there are long term factors at work in its persistent balance of payments deficits. Fourth there is the public distrust of the patch work agreement among the 14 expressed in the price of gold being fixed in the market at $ 90 per ounce at the end of March and lack of credibility that the central banks will intervene to support the dollar and ensure its convertibility. Aud finally there is the interest of the developing countries which is being completely neglected and which as not entered into the picture at any stage. Against this crisis background, the March meeting of the group of 20 countries set up by the IMF was not very productive. First it was faced with a series of decisions that had been taken by the affluent countries (the 14 countries) without consultation with the IMF or the group of 20. Second these decisions revolving around floating parities and revaluation of some currencies have unfavourably affected traditional and non-traditional exports of the poor countries, reduced the value of their reserves, the real burden of servicing their external debts and have exposed their economies to long term adverse factors for which they have no countervailing institutional arrangements. All these issues were raised but no decision or framework for decision on them was established. Third the meeting ended with a general statement which does not take us very far, such as the need for a better readjustment process on balance of payments on the basis of objective indicators and assisted by the IMF, the need for stable but adjustable parities under the surveillance of IMF with the use of floating rates in particular situations, the international management of global liquidity involving reliance on SDRs as the main reserve asset and reducing the role of the reserve currencies, the need for measures to deal with the problem of disequilibrating capital flows, the declining role of gold, and more generally the need for an international monetary order within the framework of IMF based on cooperation and consultation to promote economic development, world trade and employment and counter inflation. It will be noted that the meeting did not decide on the urgent problems of (a) the time limit for the floating exchanges, (b) the problem of increased debt servicing, (c) the link between SDRs and development assistance (on which the committee

was divided three ways, some developing countries wanting that the World Bank should be used as the means of allocating SDRs as development aid to the poor countries, other developing countries wanting such SDRs to be allocated directly to them and the developed countries with the exception of France and Italy opposed or uninterested in the linking of SDRs to development aid) and (d) the further issue of SDRs which should be some 20 billions over a five year period. Now all matters have been referred to the committee of deputies who have established a working group on currency convertibility, money flows between countries and the problem of surplus dollars. It is necessary they go beyond this list and establish in time for the Nairobi annual meeting in September of the IMF, the outline of a reformed monetary system including the role of the SDRs and the link between SDRs and development.

Development assistance : The reports of the United Nations to the Committee for Development Planning and the Development Assistance Committee (DAC) of OECD present a not very encouraging picture of development assistance at the start of the Second Decade. For the DAC countries the total net flow of public and private financial resources reached 18.2 billion in 1972 (being an increase of 8 per cent over 1971), but the Official Development Assistance (ODA) which as the report states "are the only ones which deserve to be called assistance" remained stagnant at around $7 billion. Against the UN target of 1 per cent by 1972 for total net flows, 1971 registered 0.83 per cent, and against the target of 0.7 per cent of ODA by 1975, the actual amount was 0.35 per cent. The debt of 80 developing countries is $74 billion in 1971 (from $69.1 billion in 1970). Debt servicing for these countries rose by 9 per cent in the sixties and by 15 per cent by 1970, their export earning increased by 7.5 per cent and 10 per cent at these times and GNPs by 5 and 6 per cent. Half the indebtedness is concentrated in 8 countries, India ($8 billion); Mexico ($3.6 billion); Brazil ($3.2 billion); Indonesia ($3 . billion) ; Pakistan ($2.9 billion); Israel ($2.1 billion); South Korea ($2 billion); and Turkey ($1.8 billion). On total flows UK, Netherlands, Australia, Belgium and France and Switzerland have passed the 1 per cent target and are between 0.41 per cent and 0.67 per cent of GNP on ODA, with US, Germany and Japan being far behind both targets, though US is the largest absolute donor at $7 billion of total flows and $3.3 billions in ODA. The UN reports that Soviet aid was $791 million in 1971 and $659 million in 1972. China's $492 million and $287 million. The 8 socialist countries' aid averaged $360 million each, while the DAC countries averaged $723 million each. The aid flows between developing countries were on the increase with Kuwait, Libya, Iraq, Brazil, India expanding their assistance programmes to other developing countries. Development assistance is of marginal but decisive importance in closing the gap between the rich and the poor nations. The World Bank computes that unless the aid, trade, debt programmes are considerably improved, and strengthened in the first two cases, the gap will become wider in the next generation—with the per capita incomes of the developed world being $8,000 and that of the developing world (with 2.5 billion people) being $200 at 1972 prices.

International Trade : UNCTAD reports that developing countries increased their export revenues by 15 per cent in 1972 and what is more important improved their terms of trade. Their sales of manufactures and oil increased and their incomes from primary products sales also

improved. The demand for these goods in the developed countries increased as did their prices. The negative effects of the currency parity changes will however be seen in the 1973 performance. In this connection the effect of the enlarged common market on the developing countries' trade also will be see in 1974 and 1975. The UNCTAD report refers to the adverse effect of the enlarged common market on the trade prospects of developing countries, US and Japan. It could attenuate the effects of GSP, it could by displacement effect push out the developing countries' trade in the deal between EEC and EFTA. The EEC enlargement and the formation of a free trade zone (see page 249 of the last issue) means that all West European countries will be in a better competive position than the countries receiving GSP. The United States is reformulating its trade policy, avoiding protectionist measures except in the case when confronted with what it considers unfair competition or the closing of foreign markets to US exports as in the case of some Japanese and Western European policies which are described by the US officials as "a self centred surplus syndrome". It also warns the developing countries that those who conclude agreements with the enlarged Common Market and obtain special concessions and in return grant the ECM commodities reverse preference will not be granted GSP in the US. It is therefore of particular interest to the developing countries that the Common Market executive has proposed free trade zones with associate or associable countries to market their industrial goods in Europe with greater ease than through GSP and at the same time for the EEC to give up claims to reverse preferences. In order to stabilise the export earnings of some 40 such countries, the executive proposes guaranteed prices for certain quantities of goods like sugar to be jointly decided and so avoid the fluctuation in export incomes caused by basic export price changes. These and the proposals for world trade negotiations which include further reduction of industrial tariffs and non-tariff barriers and increased agricultural products imports should be approved by its council of ministers. This is particularly important for the Asian commonwealth countries as 58 per cent of their exports are with the UK under preferential arrangements which they will lose in 1974.

World R & D: The United Nations report on Science and Technology in March states that only 2 per cent of the world's scientific and technological reresources are available in the developing countries and part of this is unrelated to their needs. The remaining 98 per cent of world research takes place in and is geared to the needs of the developed countries. Some of it such as those on synthetics and substitutes for the primary products of the developing countries sets back the development of the developing countries. It recommends the establishment of education and research institutes and the integration of R & D in the national plans of the developing countries and the allocation of 10 per cent of the 1 per cent GNP target of the developed countries as R & D for the developing countries and 5 per cent of the civilian R & D in the developed countries to be devoted to the problems of the developing countries. The Unesco sponsored international congress on "Sun in the service of man" to be held in Paris in July might be an occasion when the R & D resources of the developed countries and countries like India, Israel, Brazil and Mexico might be pooled to push forward research on solar energy as well as other effects of the sun on life and habit.

resuming the work done in the fifties. Now that the oil resources are beginning to be used at a faster rate and oil prices constantly rising, the old arguments about the costs of solar technology being non-competitive compared to the power from fossil fuel can be re-examined. The Indian solar cooker developed in the fifties was as good as and a little cheaper than a 500 Watt electric hotplate. The use of solar energy will call for social changes and adaptations and the R & D effort must have built into it the appropriate social science resources and techniques.

Asian Rice Fund: A four nation Rs. 37.5 crores Asian Rice Fund agreement has been signed by Cambodia, Philippines, Thailand and Sri Lanka. The agreement provides financing and refinancing of rice sales among the participating countries and a system of deferred payments. When ratified by 3 countries, the Fund will go into operation. It could spark important expansion of the rice trade in Asia and if Indonesia, India and Burma join it will become a powerful factor in Asian Development.

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II. Agricultural Development

Food production:

The 1972-73 food production in the State is estimated at 72.02 lakh tonnes (as forecast in Vol. III page 183 of the Bulletin), consisting of 55 lakh tonnes of rice, 15.10 lakh tonnes of cumbu, cholam, varagu and ragi and 1.92 lakh tonnes pulses. This is a good perfor mance despite the drought and flood conditions that pervailed during that year. It is the result of most of the State having been brought under the HYV programme. As a result rice procurement by the end of March amounted to 60,000 tonnes during the samba season, with FCI alone accounting for 40,000 tonnes. The samba harvest of 9 lakh tonnes includes a marketable surplus of 2½-3 lakh tonnes, of which the 20 per cent levy yielded 60,000 tonnes. The power cut initially affected the farmers in districts like North Arcot where pumpset irrigation is predominant, but with alternative arrangements made there and in South Arcot and Chingleput by the farmers, food production has not been seriously affected. Now the Government has decided to raise the procurement price of paddy by Rs. 4 per quintal and has asked for the Union Government's approval of the action. It has also set up a committee composed of officials, farm labour, land owners and consumers to travel round the State and enquire into the factors governing minimum prices for food grains and make recommendations on it.

For the current year 1973-74 the Government has fixed the food production target at 79 lakh tonnes comprising 59 lakh tonnes rice, 17.50 lakh tonnes millets and 2.5 lakh tonnes pulses. Under the Centrally sponsored emergency summer food crops programmes 2.7 lakh acres are being brought under IR-8 and other high yielding varieties of paddy, cholam, cumbu, varagu and ragi. Also a crash programme for pulses production covering 23.5 lakh acres of sunflower development over 3.75 lakh acres is being undertaken. The special

Union Government assistance for the emergency programme is Rs. 382 lakhs and in a recent review of the programme the problem of shortfall in seeds for the kharif season and fertiliser procurement was noted and action jointly by the Union and State Governments agreed upon. The State's fertiliser requirement is 1.20 lakh tonnes and the Central pool must provide 44,000 tonnes till July. In view of the fertiliser shortage the findings of the Thanjavur project in 72 farmer's holdings on fertiliser use and economy should be spread in all irrigated areas. The Aduthurai field Laboratory arranged trials in 23 types of soil covering over 80 per cent of the district's soil, and four trials for Kuruvai, samba and Thaladi were conducted with Karuna, IR-8, and IR-20. The result was that the rice crop responded quickly and largely to nitrogenous fertilisers and not to phosphorous and potassium fertilisers which can thus be easily economised. Even the nitrogenous fertilisers need about half the application for optimun production compared to the Department's recommendation. This means that in Thanjavur there can be sizeable savings on fertiliser application by limiting it to nitrogen and controlling its level. The project should be extended to other paddy producing districts. The Government is also extending the pest surveillance and forecast scheme in operation in Thanjavur district to other districts so that during the Fifth Plan the whole State will be covered. To attain the current year's target, a stepped up extension programme in the IADP area is underway involving training of extension officers who in turn will train the Gramsevaks and demonstration staff. Dramas and films are used to pass on the new farming techniques to 20 villages in each block. 3,600 primary and secondary seeds are being distributed to the farmers, multi crop practices popularised and the use of IR-8, Jaya, IR-20, Karuna, Karikalan and Kannagi for the Kuruvai season, and Ponni and Co-25 for samba and IR-20 for Thaladi recommended. The aim is for IR-20 to cover 3.05 lakh acres, Karuna 3 lakh acres, Ponni 3.45 lakh acres and CO-25 3 lakh acres.

Flood ravaged lands:

The reclamation of the 10,000 acres of sand cast land (see Vol. III pages 158 and 232) is nearly complete and will be by July at a total cost of Rs. 75 lakhs to the Government. Bulldozers have cleaned the sandy layer over most of the land and hand labour at a cost of Rs. 300-400 per acre used in the case of small and scattered sand cast lands. The major beneficiary has been South Arcot which suffered most, followed by Coimbatore, Salem, Dharmapuri and Tiruchi. The Government has also announced a number of concessions in the areas covered by the Parambikulam-Aliyar and lower Bhavani project involving waiver of penalties for use of irrigation from non-authorised sluices and wet cultivation in the ayacut lands affected by seepage. The floods have also left behind a residue of salinity and alkalinity which needs to be treated with gypsum and either green manure crops or where paddy is grown IR-9 and Jaya, or Co-453, Co-975 and Co-1148 sugar cane or ragi and sunflower which is resistant to these conditions used.

Some research results:

The Central Rice Research Institute has demonstrated the success of rice cultivation with less than half the amount of water (30 to 40 acre inches) than what is usually used. Under such water management so appropriate in our growingly water scarce land, rice cultivation areas can be increased by around 50 per cent, save large expenditures on irrigation and increase rice production sensibly. Another breakthrough is the identification of one of the causes for the

poorer response of rice vis a vis wheat in regard to HYV sowings. Lack of zinc and to a lesser extent manganese in the soil, particularly in North Arcot, South Arcot and Nilgiris districts, affect the yields of Kannagi and Jaya and to a lesser extent IR-8, Padma, Cauvery, and (T)-1, Karuna and IR-20. The other varieties, Kanchi, Annapurna and Patna are thus better adapted to this soil condition, while a small application of zinc and manganese to the soil doubles the yield - particularly in the case of IR-8. These results should be applied during the current year in the 3 districts. Another development of interest to rice farmers is the water management and land use techniques followed in one of the State Farm Corporation Farms in Suratgarh, where in a block of 264 acres one of the highest paddy yields in the Country and the world has been attained at 46·87 quintals per acre. Now the spread of these breakthroughs to the farmers depends on an effective extension service which has the double task of diffusion of research results and advising on the problems faced by the farmer. The Farm Advisory Council of the Tamil Nadu Agricultural University (see Vol. III page 185 of the Bulletin) uses the 600 scientists of the university to perform this double function, each member working with the farmers continuously and bringing back to the laboratories the more serious problems of pests, disease, poor flowering, etc. which need detailed analysis. An area where the extension as well as the repair and maintenance service is essential is in regard to plant protection, where unlike the use of HYV or fertiliser application, all farmers in a block have to take concurent protective measures to avoid individual and collective losses. This is an area which needs attention and development in the State, particularly as aerial spraying of pest control has been replaced at the request of the farmers by manual methods. The need to train the farmers to keep their plant protection equipment under repair and provide efficient repair services by the various agro service centres in the State is emphasised. The Government is evaluating the working of the crop insurance scheme in the Coimbatore district in order to decide on its extension to the entire State as a further help to the farmer. Another development of immediate use to the farmer is the crop drier developed by the Tamil Nadu Agricultural University to dry food grains and cash crops during the monsoons, counter mould and wet storage damage and reduce their moisture content. Apart from the large scale driers of the FCI, the university has developed a Rs. 8,000 chamber drier using electricity to dry one tonne of grain. Also a smaller rectangular metal bin drier costing Rs. 3,000 using kerosene, can dry 125 kg of red chillies or 500 kg of paddy. These prototypes should now be produced by our metal firms for extensive use by the farming community.

The problem of increasing sugarcane yields and sugar recovery in the State and Country needs more attention and research. The dilemma for the grower is that canes with high sucrose content and quick maturing varieties weigh less and the system of payment to the growers by weight makes the growing of these varieties unattractive. On the mill side, the average mill works for 120–150 days a year and the desirable increase of this period depends on the availability of cane with good sucrose content for a longer period. The answer to this dilemma is to popularise the replacement of the mono-culture cultivation of sugarcane by mixing early varieties like CO-658, CO-997, CO-527 with late varieties like CO-419 and CO-740 and induce the cane growers to diversify their plantings by offering appropriate premium payment for early varieties. On this SISMA can help in quantifying and

rationalising the payments. Sugar mills can also increase the cane yield by converting the sugar effluent, which at present is a growing source of water and river pollution, into a cane plant nutrient as has been done by Sakthi Sugars at Appakudal. There the factory effluent is treated by a Rs. 3.5 lakh disposal plant which mixed with water is pumped out to 130 acres of cane producing dry lands, providing them with the requisite nitrogen, phosphorous and potash resulting in high cane yields with rich sucrose content. Another development is in cotton growing in the neighbouring State of Mysore and in which this state is heavily in deficit. Our needs for superior cotton are largely met by Sudan and UAR imports. Now Mysore with the help of its Agricultural University has developed two new varieties Hybrid-4 and Varalaxmi which are superfine cotton, 1-3/16 inches spinning 60-80 counts. Their being grown this year over 10,000 acres will provide the textile mills in this State with the superior varieties they need. Pest control of groundnuts, cotton, coconut has advanced a further stage with the use of biological techniques being used by the Tamil Nadu Agricultural University and the IARI research centre in Kayankulam, involving the use of gamma rays to sterlise the male variety—the red hairy caterpillar or the red palm weevil—so that the future increase of these pest is kept under control. This is an important breakthrough for the cash crops in the State. The Government is also developing pineapple cultivation in the North Arcot District to feed the cooperative fruit processing and canning unit at Vellore. This linking of cropping pattern with the agro-industrial unit the district under adequate fertiliser application and pest control conditions will yield the district Rs. 5,000 per acre.

Dairy farming:

Dairy farming in the State and Country has received a boost as a result of two developments in March. 77 cattle—28 bulls and 49 heifers from New Zealand as part of the programme to import 756 animals from New Zealand, USA and Denmark landed in Menambakkam on March 11. Of the 77 cattle which came in, 16 heifers and 7 bulls have been allocated to this State and are being located at the United Planters Association of South India farm at Coonoor. On March 29, a further group of 58 cattle from the US and Denmark landeded in Meenambakkam of which 15 heifers and 2 bulls from Denmark and 12 bulls from the US have been allocated to this State and located at the Tamil Nadu Development Corporation's cattle farm at Ooty. This programme sponsored by Operation Flood and the Indian Dairy Development Corporation should increase and improve the quantity of milch cattle in the State and the Country. Our average yield per cow is 200 litres against the 3,200 to 3,700 litres yield in the developed countries. The three important factors which can lead to an early upgrading of our lactation to 2,500 litres are intensive cattle breeding, improved fodder supply and an integrated programme of production, processing and marketing of milk. In fact all these can be attained very speedily and at low cost as demonstrated by the Madras Christian College Farm where through controlled breeding, adequate fodder supply and good organisation, the milch cows yield 4,286 litres. The other key elements for the development of the dairy industry in India were the recommendations of the March meeting of the Tenth All India Dairy Development Conference held in Madras which has proposed (a) an insurance cover for milch animals with veternary doctors as agents, (b) fair prices for milk based on

production cost, (c) channelising needed inputs of the industry through cooperatives, (d) elimination of uneconomic cattle and simple and reliable methods of quality control of milk and milk distribution, (e) training the farmer producers in processing, distribution and management techniques, (f) improved supply of cattle fodders and concentrates including use of alternates like tree leaves, monsoon and forest grass, molasses, the use of urea in place of scarce oil cakes, (g) cattle health to be ensured by appointing one veterinary surgeon per 10,000 cattle (h) improved distribution through use of vending machines, and mass supply of low cost, high protein, low fat milk and (i) the allocation of Rs. 30 crores for dairy R & D which now depends to the extent of 90 per cent on imported technology. These recommendations form a sound basis to back the State Planning Commission perspective animal husbandry plan for this State.

Fish farming:

Further to the Five point fisheries development programme outlined in the last issue of the Bulletin (pages 258 and 259), the Government has under consideration the formation of a public limited company to own and operate the large sized fishing vessels and market the products. Another public company is to be set up to operate the Mandapam yard for building specialised medium size trawlers. The engineering and feasibility studies of the fishing harbours scheme at Chinnamuttam, Kodaikkarai and Mallipatnam referred to in the last issue have been completed by the UNDP on the basis of which the detailed projects are being now submitted to the Union Government for financing, estimated at Rs. 10 lakhs each. Further the recently formed harbour investigation team is investigating Pulicat, Ennore, Mahabalipuram and Tirumullaivaram for fishing harbour sites. Work on the fishing harbour at Tuticorin has been slowed down (after completing 50 per cent of the dredging of the basin and channel) because of the difficulty of getting a dredger for which the Government has now contracted with a Calcutta firm. Finally the Pulicat estuarine species culture project, the Adyar prawns back water project, and the induced carp spawning project which will add 1.5 crores fingerlings to the 4.5 crores collected from natural sources are now at the operation stage.

Coffee:

The coffee production figure for 1972-73 at 90,000 tonnes and the forecast for 1973-74 surpassing 1.1 lakh tonnes outlined in the last issue (page 257) of the Bulletin and the problem created by declining internal demand for coffee still stand. It is in the export side that the picture has brightened. The problems created by the expiration of the export quota agreement outlined in the last issue of the Bulletin have for the present been solved. The Coffee Board's representation to the International Coffee Organisation (ICO) has resulted in the allottment of India's proportionate share of 1.1 million bags which is 6,000 tonnes plus a special allotment of 40,000 tonnes to help clear the large surplus. This means that of 87,000 tonnes produced for the season and the carryover from the last season of 13,000 *tonnes making a total supply* of 1,00,000 tonnes, 46,000 tonnes is exported to quota countries, 15,000 tonnes to nonquota countries, leaving 39,000 tonnes for internal consumption. Due to the decline in Brazilian coffee production due to crop damage, international prices have hardened to the point where the net export price per tonne after paying the

export duty is Rs. 500, which is higher than domestic prices. The non-quota prices seem to be softening and so the Coffee Board's decision to have a common auction for quota and non-quota countries is sound. It now remains to negotiate the ICO continuation and the new quota system, because the self restraint scheme cannot really continue beyond this year. The other problem is to campaign for the increase in domestic coffee consumption and use the pool fund for this purpose. One means of increasing coffee consumption both internally and and internationally is to develop the instant coffee line of production and it is to this that the Coffee Board should now turn its attention.

Tea:

The exports of tea during January and February this year was 5.6 million kg. lower at 27.5 kg. 1972 recorded a slight increase in exports at 207.44 million kg against 206.07 million kg in 1971, with production at the figures reported in the last issue of the Bulletin (page 258). For Tamil Nadu the tea industry faces two serious problems. The first is the 75 per cent power cut referred to in the last issue which for the first time has been applied to tea plantations. The continuation of the cut in April and May which is the cropping season had very serious consequences. The 20 per cent of the factories which had stand by generators used them but at a unit cost of 22-25 paise higher than when the usual power supply was available. The result is that the plantations and factories are rushing in with sales of green leaves. The second problem affecting the State is the recent wage increase of 35 paise per day to men in four steps in the course of a year. This increase in wages from Rs. 3.35 to Rs. 3.70 and for women from Rs. 2.80 to Rs. 3.05 was overdue as indicated in Vol. III page 186 but comes at a time when the cost push factors are all operating simultaneously. Added to this is the falling tea prices internationally. Tamil Nadu teas sold in Coonoor and Cochin markets have slumped by 20—26 paise per kg in Cochin and 81 paise in Coonoor. Internationally the tea market today is a buyers market as world production is increasing by 3 per cent and demand by less than 1 per cent. Fortunately, for the State and Country, Indian demand for tea is growing by 5.8 per cent per annum. But internationally the profit margin is declining as we face falling prices, and decline in India's tea sales to Sri Lanka and Africa. India's share of the UK market has fallen from 115.4 million kg in 1950 to 95.5 million kg in 1970 and the percentage drop is even larger from 63.1 per cent to 47.7 per cent. The new markets opened in USSR and the Arab countries do not compensate this loss. The global figures of foreign exchange earned by this industry (Rs. 148 crores in 1970-71 and Rs. 160 crores in 1971-72) are used to hide our declining export share (down to 29 per cent in 1969). The abolition of the export duty by the Government in the face of this trend did increase exports. This should now be followed by a well planned hard hitting campaign of tea promotion in the Western countries run by an independent propaganda organisation and financed from the export or excise duty proceeds along lines recommended by the Baruah Committee.

III. Industrial Development

Neyveli:

The Neyveli complex is being restructured and expanded. In early April a new crawler mounted spreader with a load capacity of 8,000 tonnes/hour was added to the equipment to help the Corporation to attain the target of 6.3 million tonnes of lignite and as part of the programme of investing Rs. 50 crores for additional excavation, spreadn and ancillary equipment. For the current year 1973-74 3.6 million tonnes of lignite will be lifted and for the following year it will reach 4 5 million tonnes, with the Rs. 16 crores currently in the investment pipe line. As a result, power generation from lignite now at 350 MW to 400 MW will be stabilised for the next 2 years and when the 2 boilers are oil fired (the civil works have begun and BHEL will deliver the equipment in November) and begin operation in March 1974, a further 100 MW will be generated, making for a daily supply of 10 to 12 million units. The cost of this oil conversion of Rs. 1.2 crorees borne by the State Government will be amortised over a five year period, when the boilers will be restored to lignite firing and the oil installations used for the fertiliser plant. With the higher Neyveli power rates negotiated with Tamil Nadu Electricity Board at 8.1 paise rising to 8.6 paise by 1976-77 (see Vol. III page 160), Neyveli power will be paying its way. The next stage is for the rest of the investment —Rs. 33.34 crores on excavating machines and connected conveyor auxiliaries to be made to enable the Corporation to move from raising 4.5 million tonnes to 6.5 million tonnes of lignite. The third stage is the opening of the second mine cut on which the Union Government's Fuel Policy Committee has now a feasibility report which with its recommendations will be examined by the Project Investment Board and if approved will be included in the Fifth Plan draft coming out in September. With this second mine, a 800 MW power station at a total cost including that of the second mine of Rs. 200 crores can be established. The economics of the second mine is being workd out. Its base is that the low calorific value lignite which is being and can be mined at Rs. 36 per tonne is cheaper than coal imported or transported from Andhra or Bengal. The second part of the Neyveli complex the fertiliser plant is working well below capacity not because of lignite unavailability but because it needs to be fired by furnace oil. The Fertiliser Corporation is now preparing a project report to convert the ammonia gassification plant to furnace oil and make the functioning of the 300 tonne a day plant viable. As stated earlier, this changeover would take 4 years by when the oil installation of the power plant will be freed for use by the fertiliser plant. The Union Government is also examining the possibility of locating in Neyveli one of the five oil based fertiliser plants to be erected during the Fifth Plan with the collaboration of Toyo Engineering (see Vol. III page 174, 175 and 245). Neyveli has locational advantages of cheap power and abundant water for the location of one of the 900 tonne ammonia and 1,500 tonne urea plant. The third component of NCL is the briquetting and carbonisation plant which is now working at very low levels in order to give the plant the maximum lignite. Of its eight carbonisers, studies are under way to switch 4 carbonisers to coal (to be brought from Singareni at the rate of 600 tonnes per day) and the other 4 to use lignite and continue producing the valuable by product and foreign exchange earner, catechol. The Fifth Plan holds important prospects for all round development of the complex but

for this two prior conditions are essential: industrial peace in the complex with some rise in labour productivity, and firm investment decision during this year—the last year of the Fourth Plan.

Boiler plant:

The second expansion phase plan of the Boiler Plant, Tiruchi outlined in Vol. II No. 10 page 21 and 22 and Vol. III page 35 of the Bulletin has been approved by the Union Government and is part of the Rs. 220 crores budget for 1973-74 of the BHEL units at Tiruchi, Hyderabad, Hardwar and the Heavy Electricals, Bhopal, which has been merged with BHEL. The Tiruchi plant expansion involves (a) Rs. 4 crores for introduction of large size boilers; 200 MW to 500 MW with the latest design technology, (b) Rs. 12 crores for increasing the installed capacity from 750 MW to 2,500 MW (as noted in the Vol. II No. 10 issue) and (c) Rs. 0.5 crore machinery for manufacture of steam generators for nuclear power stations. This whole programme of Rs. 20 crores is financed from its own funds generated over the past 7 years, will provide employment to 2,000 persons including 500 engineers, and will expand its service units and ancillaries by more than 3 times. The capital output ratio for the plant is 1:1, a remarkable record in the field of heavy engineering. The Planning and management of this public sector unit continues to be a model.

Hindustan Teleprinters:

Hindustan Teleprinters is making slow progress as analysed in Vol. II No. 11 page 27 with its Fourth Plan expansion programme of Rs. 1.20 crores and the Fifth Plan expansion planned for Rs. 2.77 crores which are to be met out of its internal resources. Its pricing policy is found at Rs. 5,300 per unit which unlike other similar products is about half the price of an imported machine. Its total production is however still low, its export is small at Rs. 7.42 lakhs and its diversification programme just starting.

Kalpakkam and Tuticorin:

Increased provision has been made in the current year's budget for the Kalpakkam atomic power station units one and two and for procurement of machinery and equipment. The reactor research centre will have. Rs. 3.50 crores against Rs. 3.18 crores for last year. The provision should help the Centre to keep to its time schedule and build in the agreed mechanisms to avoid interruptions and breakdowns. Tuticorin is one of the four locations where heavy water plants required for atomic power stations are to be developed within Rs. 13.60 crores made in the current Union budget.

Yarn:

March and April saw a worsening of the yarn situation in the Country and the State, briefly analysed in the last issue of the Bulletin (page 261). The major problem is the reduction in the production of yarn consequent on the power cut. For the Country, yarn production declined from 80.4 million kilograms in August 1972 to 67.2 million kilograms in February. In Tamil Nadu which produces one third of total yarn output of Country, the 75 per cent power cut has reduced production from 56,000 bales of yarn per month to 16,000 bales per month. The power cuts in Uttar Pradesh and Maharashtra have had similar effects on yarn output. Second there has been some hoarding of stocks which has further made for scarcity and runaway prices. Third in face of this the Union Government enforced in early March controls over distribution, production

pattern and prices of yarn in order to help the decentralised sector—the hand looms and the power looms industry. The production which has fallen to 27 million kg per month (from the 67.2 million kg in February) is distributed under the following rules : (a) all yarn manufacturers will sell only to the Textile Commissioner; (b) the manufacturers must pack 60 per cent of their yarn in hanks for handloom and 30 per cent in cones for power looms; (c) hosiery yarn producers will continue their production under statute. Prices have been notified for each unit with special allowance for Tamil Nadu and Uttar Pradesh because of their heavy power cuts. The States were totally unprepared to act on this decision and had no distribution organisation. The immediate effect—running through the end of April—was a total mess. Weavers in this State were without yarn and the State Government's plan to take over all yarn production in the State and distribute it to the weavers was given up at the insistent urging of the Centre. On the other hand at April 20, 35,000 bales of yarn valued at Rs. 6 crores piled up in the State mills. SIMA reported to the Union Government that no State Government except Tamil Nadu had lifted its quota, that the other State Governments were arguing and indulging in useless correspondence and one State Govenment was even bargaining for a commission from the mills. Andhra weavers who used to get their yarn from this State were allocated Kerala, Punjab and Delhi mills yarn. While the weavers in this State were on strike and in violent agitation, the mills with over 5 weeks of stocks were losing heavily. This State's need was 55,000 bales but the Union Government's allotment was only 11,000 bales which was distributed through cooperatives, local committees and in Karur (where there are 30,000 looms and 50,000 families depending on the handloom industry and where for March and April not one inch of yarn was available) through yarn cards to master weavers. This has been a sharing of scarcity of the State's allotment and is about 1/5 of what its decentralised sector needs. Fourth there has been some bogus swelling of demand of the decentralised sector by the States. There are 30 lakhs handlooms and 1.8 lakhs authorised power looms, using 34 million kgs of yarn. But the total demand put up by the States was 112 million kgs. Fifth there is the problem of yarn export which though a small part of the total production is a drain. The Government has decided to regulate it and place a ceiling on it but not ban exports. For export contracts under execution, deliveries are to be staggered beyond July 1973 when the power situation will be normal and production will pick up. Fresh contracts should be registered with the pool for deliveries after September and under an overall ceiling. The main remedy is a resumption of normal yarn production which will only be possible after the power cut is lifted. In the meanwhile some small increases in this State's production are being arranged with Maharashtra power supply in return for which yarn is to be made available to it. The short term action needed is for the States and Centre to set up and operate an effective distribution system.

Cement :

The power cut has also reduced cement production in the State which has been a surplus one, to the point where its own needs cannot be met and prices have doubled to Rs. 26 a bag and construction activities halted. Under these conditions the Government issued an order in late March to regulate the distribution of cement, which licenses all cement

traders, limits stocks to 5 tonnes, regulates purchase under the authority of the permit issuing authority and prohibits sale of cement by the licensee. The normal cement production in the State is 2 lakh tonnes per month and with Kerala supply of 3 lakh units of power, the monthly production stands at 90,000 tonnes. There are long term problems also. The industry has not been increasing its capacity in the last 2 years because of transport bottlenecks, labour troubles and falling returns to investment. Hence even after the power situation becomes normal, cement will continue to be in short supply. The industry will not be able to meet the backlog of demands now piling up unless its expansion plans are resumed and there is some continued regulation of distribution.

TIDCO: TIDCO's operations which started with Alangulam cement and Arkonam concast plants are now expanding to 20 medium industries and its capital doubled to Rs. 20 crores. In addition to investing Rs. 3.5 crores in SPIC and Rs. 24.35 lakhs in other joint sector projects, the Rs. 18 crore Tamil Nadu Rubber Plant in collaboration with General Tire, US in the 240 acres estate in Tirupattur, Ramanathapuram district, the Rs. 8 crore sponge iron project as an adjunct to concast, the LASCO alloy steel plant in Dharmapuri, the Rs. 12 crore Tamil Nadu synthetic fibres plant are being launched. There are also the TIDCO schemes for Madurai and Thanjavur districts under study - the Rs. 80 lakhs petrochemical unit, the Rs. 75 lakhs nylon factory. The possibility of a mini steel plant using the 140 million tonnes of iron ore in the Tiruvannamalai area with its 33.35 per cent iron content is under study by a Japanese firm for the State. TIDCO also is working on the letter of intent for the Rs. 3.6 crores marine diesel engine production plant with a capacity of 1,000 engines per annum. All these medium plants are likely to begin operation at the start of the Fifth Plan and are provided for in the State's Fifth Plan document.

SIPCOT: SIPCOT's programme of industrialising the State's backward areas spreads over the three complexes of Ranipet, Ramanathapuram and Hosur—Krishnagiri. The Ranipet complex is developing on 12 acres of SIPCOT land on which Rs. 1.5 crores of infrastructural facilities have been built. 12 major and medium industries producing a wide range of products from chemicals, steel tubes to tools and drawn from Delhi, Maharashtra, Haryana as well as this State are establishing the units there. Similar development programmes are being planned for the other complexes. SIPCOT is also commissioning or financing feasibility studies in a wide range of fields from manufacture of steel technological equipment to laminates, fibre glass and capacitors. It is also acting as the Union Government's agent in administering the 10 per cent outright grant or subsidy to industries located in the 17 backward taluks of the State. This is a good record for its first year in dispersing industries and industrialising the backward regions. SIPCOT is also taking action to expedite the conversion of letters of intent obtained by industrialists in the State into operating units. Of the 1,052 licenses so far issued, 830 have been converted into operating units. There are 286 letters of intent which have not been as of April converted into licenses. 17 have been cancelled or surrendered, 12 are being converted into licenses, 23 awaiting Union Government approval of collaboration agreements and 13 are awaiting the grant of import licenses. There are 221 persons with letters of intent whom SIPCOT has not been able so far to contact. In this con-

text it is important for the Union Government to work closely with SIPCOT before granting letters of intent in judging the real suitability of projects and their possibility of realisation. The letter of intent issued to the Allied Engineering Corporation, Salem which has not been supported by SIPCOT, the Banks, IDBI, the Inventions Promotion Board is a case in point. Once letters of intent are granted, the procedures of the Union Government should be streamlined and rationalised to speed up the issue of licenses and the start of operations (see Vol. II No. 12 page 28 and Vol. III page 14 of the Bulletin). The procedural bottlenecks also apply to the efforts of unemployed engineers to set up units. At the March seminar in Salem of the Society of Mechanical Engineers, the unemployed engineers detailed the lack of coordination and complicated and confusing instructions from Government and banks, leading to long delays that have resulted in many of them giving up the projects that they had developed. In one case enormous correspondence was piled up, as Rs. 50,000 in immovable security and Rs. 40,000 as third party guarantee were obtained and yet the Rs. 3 lakh loan for starting a foundry project was not made. In another case, complicated questionnaires were filled and duplicating rules adhered to and the only result was that the industries department which had assigned a workshop informed the technician concerned that the allotment would be cancelled unless the hire purchase instalment of Rs. 7,000 was paid. The discouraging response of banks and LIC officials and the problems of power and water supply in the cooperative industrial estate in Salem were further bottlenecks. There is here a large area for simplification of procedures and quick decision in which SIPCOT can help.

Karaikudi's copper poweder:

The Central Electro-Chemical Institute, Karaikudi, has developed the know how for producing copper powder from copper sheets. Copper powder is used in splintered compacts, porous bearings and anti fouling paints to the extent of 100 tonnes per annum in the Country. Now a plant can be set up in Ramanathapuram with a capital outlay of Rs. 15.27 lakhs and with and with an annual capacity of 150 tonnes per annum. At the current price of Rs. 35 per kg of copper powder, the plants return will be over 90 per cent. This is a plant that SIPCOT should promote as it can be located in Ramanathapuram.

Aluminium and white clay:

MALCO's management takeover proposed by the Government (see page 228 of the last issue) is under study and consideration by the Union Government. The State Government has clarified that its take over will leave undisturbed the collaboration arrangement with the Italian firm. MALCO has recently expanded its capacity from 12,500 to 18,000 tonnes but till the summer has had to curtail its production to 8,000 tonnes due to the power cut. With similar reductions in Hindalco and Indian Aluminium, the Country and the State face a serious shortage in aluminium. The power cut has also closed down industries based on white clay in South Arcot. The Neyveli ceramics and refractories factories, the Seshasayee industries producing insulators and the Vridhachalam ceramics unit of the TNSSIC have all been closed, involving unemployment of 2,000 workers. All hopes are now pinned on the monsoons when the power cut will be lifted. The decline in industrial production in the Country as a result of the power cut is conservatively estimated at Rs. 1,000 crores and unemployment at near an

additional 10 lakhs. This State's share is rather large because it has now the heaviest percentage cut.

Leather :

As forecast in the last issue (page 261), the free international trade and export in leather ended with the January banning of the exports of raw hides and skins and the April 1 enforcement of the system of quota for all exports of semi-processed hides and skins and a 10 per cent export duty on semi-finished hides and skins in 1971-72 was Rs. 90 crores and in 1972-73 was Rs. 150 crores. The aim of quota system and export duty is to reduce their exports to 25 per cent of the 1971-72 quantity by 1978-79. The further aim is to encourage the manufacture of leather goods in the Country and increase their exports. For the moment as is usual when Government acts without adequate prior preparation, everything is in a state of suspended animation. Business and trade in all sections of the leather industry has fallen off due to the uncertainties as to what are the quotas, to whom, how much, for how long? A Union Ministry of Foreign Trade Committee visited Madras in April to examine such questions as the export quotas for small merchant exporters, quotas for non-exporting tanners so that they are not left to the mercy of quota holders, quotas for new and young firms who had no exports in 1971-72, the inter-changeability of quotas for EI tanned to chrome tanned and the other host of questions. For now exports of semi processes hides and skins are not banned but are allowed and will be adjusted against the quotas when established. The internal prices of footwear and leather goods are rising very fast and the small scale sector in this area of a is suffering hardship because they cannot meet the price escalation of leather. Whether the Government action will increase and improve leather manufactures in the Country, bring down their prices, improve the export performance of this steady and growing foreign exchange earner depends on how soon these rules and regulations are clarified and how they are administered, how STC through whom semi-processed hides and skins have been channelised performs and the scope and functioning of the Leather Export Development Corporation proposed by the Government in place of the leather authority that should have been set up (see Vol. III page 189 of the Bulletin).

Private sector reports :

The annual report of Aruna Sugars records the expansion of the plant capacity from 2,000 tonnes per day to 3,000 tonnes of cane crushing a day by December 1972 at a cost of Rs. 1 crore financed partly by IFC and ICIC and its own resources and its plan in view of the Fifth Plan target of doubled sugar output to 60 lakh tonnes to expand its capacity further this year to 4,000 tonnes at a cost of Rs. 2 crores. In 1971-72 the company's working record was good, crushing 2.69 lakh tonnes of cane, producing 2.54 lakh tonnes of sugar, at a recovery rate of 9.39 per cent which was a 12 per cent improvement over the previous year largely due to the better quality of cane. The company's balance sheet shows a net profit of Rs. 58.37 lakhs, the development rebate at Rs. 37 lakhs and general reserve at Rs. 47 lakhs. The price of cane for the factory was that fixed by the Government, Rs. 90.30 per tonne. Its subsidiary Arvind Distillery also has performed well, ending with a profit of Rs. 2.5 lakhs. Labour relations have been good and the bonus and *exgratia* payments amounted to 36 per cent of the annual wage. The annual report of the Madras Rubber Factory for 1971-72 records capacity increase in the Madras and Kottayam plants, the

start of the new automobile tyre and tube manufacturing unit in Goa and the fourth plant to manufacture cycle tyres and tubes in Arkonam, involving in all Rs. 3 crores as capital expenditure and a total licensed capacity of ten lakhs. The R & D sector has been expanded at a cost of Rs. 10 lakhs, concentrating on product improvement and import substitution of raw materials, tyre type designs and tyre and tube machinery development. The results are incorporated in the 4,00,000 tyres and tubes capacity of the Goa plant, belted bias tyres and radial ply tyres, rapid cure systems with micro wave heating, use of computers in rubber compounding and increasing diversity of raw materials, such as polyester fibre glass, polymers, etc. As at 30 September 1972, sales increased by 55 per cent over the previous year, reserves stand at Rs. 2.67 crores and a 12 per cent dividend declared. The problem from February has been the 75 per cent power cut in the State which has led to some reduction in production, despite the use of 4 generators and the full functioning of the Kottayam plant. The annual report of Binny for the year ending 31 December 1972 shows a profit of Rs. 2.76 crores against last year's loss of Rs. 86 lakhs, with a prospect of wiping out the cumulative past losses (see Vol. II No. 1 page 13 of the Bulletin) by 1974. Despite the disturbed labour situation and the power cut, the sale value of cloth produced in Madras and Bangalore rose, the work on the new polyster plant will help it to go on stream next year, the improvements made in the various departments of the two mills and the marketing research cell has started to improve marketing. The firm's 1972 exports amounted to Rs. 1.83 crores. The garment factory has not functioned well and needs reorganisation as also the engineering division, the Giovanola subsidiary, and the trading and shipping divisions. Labour relations are improving but the power cut which will involve a 16.23 per cent reduction due to the shut down period of the firms' generators and boilers will add to labour unrest. If the firm's plans for restructuring and expansion are successfully carried out, its internal and export performance this year will improve. EID-Parrys annual report for the year ending 30 September 1972, records a profit exceeding Rs. 1 crore, which like Binnys is a positive performance over the losses of the last 2 years (see Vol. II No. 4 page 20 of the Bulletin). The record was held back a little by the Nellikuppam Sugar Factory strike in March 1972, which crushed 3.73 lakh tonnes of cane, producing 29,619 tonnes of sugar which was less than last year's. The December floods affected the Cuddalore holdings and cane production in the area. The spirit plant is being expanded and fertilisers sales under the marketing arrangements with Madras and Coromandel Fertilisers (see Vol. I No. 7 page 9 and Vol. II No. 6 page 21) have been expanding though the traditional mixtures demand declines. The Ennore Fertiliser plant and the sanitary ware production are expanding, the latter by double to 4,920 tonnes per annum. The labour situation is poor and is a constraint to the functioning of the firm. If this were to improve and the power cut lifted from July, the Nellikuppam, Ennore and Ranipet plants ought to perform even better this year. The annual report of Madura Mills for the year ending December 31, 1972 reflects the labour trouble that the plant faced through the greater part of the year. Yet the total turnover was a little higher than the previous year's as also its export performance which was Rs. 7.6 crores compared to Rs. 6.2 crores in 1971. The plant's Rs. 165 lakhs modernisation programme was actively pursued with regard to machinery in various departments in

order to reduce costs and improve quality. The modernised Pandyan mill was reopened in July 1972, expansion of looms at Ambasamudram and license for further installation of looms have been received and executed. The Management by objectives introduced in 1971 (see Vol. II No. 4 page 20 of the Bulletin) has now a high payoff in higher productivity and economy in costs and raw materials. The Union Government's approval is awaited for the amalgamation of Madura Mills, Harveys, and Coats into a new Rs. 15 crore company which will be launched, it is hoped, during the current year. The annual report of W. S. Insulation for 1972 shows the effect of the power cut on the plant despite the use of its two standby generators, with the result that 15 per cent of its staff has been laid off. Its R & D section, the impulse testing laboratory, is working on the development of lightning arresters for 400 KV systems. Some diversification of product will follow the new unit at Bangalore. These 6 annual reports show a moderately good performance of the private sector in the State in a rather unusually difficult year of cost escalation, labour troubles and power shortages.

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IV. Education, Science and Health

Unrest in Educational Institutions:

March and April, the examination season, witnessed unrest in various forms in 23 groups of educational institutions in the Country. The largest number (10) were directly related to examinations. In Bihar police opened fire on a mob which raided a secondary examination centre; in Kerala University examinations were postponed by more than a month as a result of student agitation; in Bhavnagar college teachers refused invigilation work because of students assaulting them; in Ahmedabad several thousands of students in the B.Com. examination walked out of the hall when the question paper on Economic Development was distributed because they claimed it was too tough; in UP an invigilator was shot dead at the Shahjahanpur examination centre; in Fategarh a carrier pigeon was used in an attempt to cheat at the examination; in Srinagar high school students walked out of what they called the stiff geometry exam paper and broke up all exam centres in the city; in Lucknow University students threatened boycott of the examinations as part of the medical college strike; the medical college staff and students demanded a judicial enquiry into what they called engineered intimidation, assault and insult and demanded the resignation of the Vice-Chancellor. The other 13 cases trace to a wide variety of causes of violence and unrest: Allahabad students raided and damaged a newspaper office which reported on student disturbances in the city; in Sagar police burst teargas shells to disperse stone throwing students who were gheraoing a hostel warden; in Coimbatore students came out on strike to support the agitation of graduate teachers; in Madras graduate teachers went on strike hunger fast and courted arrest in support of their six point demand to improve their status (incidentally it is now becoming routine in the Country for teachers to go on strike, court arrest and disrupt the education system in

order to obtain improvement of their status); in Dindigul high school students took out a procession, damaged public transportation and political party offices as a political demonstration; polytechnic students in the State went on strike and courted arrest to secure improvement in their employment condition; Benaras University was closed after continuous student agitation which included a demand for the resignation of the Vice-Chancellor; the Madras University convocation was marked by a demonstration of students demanding jobs not degrees; Annamalai University advanced its study holiday and closed its hostels in view of extensive student disturbances; the Gwalior University agitation led to the resignation of its Vice-Chancellor; Allahabad University was closed after violent student demonstrations including four students who were shot in a midnight battle with their lecturers and here again the resignation of the Vice-Chancellor was demanded; the Rajasthan medical college students' agitation for improved conditions continued till early April; the Aligarh University was closed after a mixture of student agitations and unusual interest in its affairs by the political parties; Andhra University students continued their strike in to April as part of their demand for a separate state; in Indore pitched battles between cinema loving students and police ensued because the students could not get tickets to a 11-30 a.m. show. The educational system is thus slowly grinding to a halt as noted in the last issue on the same subject (page 263-264). The short term remedies include exhortations at convocations and public occasions to students to devote themselves solely to study (which has not helped); a grievance committee which Delhi University has set up to look into all the problems of students; and a scheme for insuring invigilators which Indore University has put into operation. (Each invigilator has been insured for Rs. 10,000 and 800 invigilators and employees who are on duty for the 28,0(0 examinees with the help of the police have been insured for a total of Rs. 80 lakhs, of which the University's payment of the first year premium is Rs. 45,000). The real remedy, for which we have reached almost the last days, is the reform of the system.

Educational reform:

In this context, the education reform in the State and Country registered during the 2 months some further advance. The State is planning the setting up of a separate directorate of primary education in order to reform and restructure this stage which is of importance to all groups and classes in the State, though the State Planning Commission's Task Force had recommended a single school and out-of-school directorate with decentralised structure. Whether there is a separate directorate for primary eduction or not, it should (a) cover school and even more important out-of-school first level education and (b) it must be decentralised as recommended by the Task Force. The Government also informed the April session of the Assembly that it is examining the Task Force Education Plan for the 10 + 2 + 3 structure, bearing in mind the administrative and financial implications. The debate on this structural reform in the State is now wide ranging, with the publication of the report of the Madras University Syndicate committee which for financial reasons has come out in favour of continuing the existing system. Its consultation with principals of 81 colleges resulted in 55 colleges expressing themselves in favour of 11 + 2 + 2, 23 colleges in favour of 10 + 2 + 3, and 3 colleges in favour of the existing 11 + 1 + 3. The Syndicate committee opts for the existing structure because it wants students to enter college at 16 plus and not 15 plus,

the majority of students who do not enter college in rural areas can have 11 years of schooling instead of ten, the 2 year Intermediate course would involve accomodation for 1 lakh more students at a capital cost of Rs. 7.19 crores and teacher cost of Rs. 1.84 crores, with teachers not readily available. The usefulness of the 1 year PUC can be increased according to the committee if the SSLC results are published on 1 May and PUC students start their studies on 1 June It is good that the Madras University Syndicate committee has come out so clearly in favour of the status quo for that helps in the current wide understanding and intelligent debate by educators, parents, legislators and the Government of the reform issues involved. The Government is also drawing up a minimum needs educational programme, listing the State's basic requirements of school buildings, equipment and teachers to meet the qualitative and quantitative demands for school education. Here again the issues are clearly set forth in the Task Force report on the kind of restructuration of eduation (and not only school) reform needed. One matter however should be clear. The Government will have to rely on its resources for the renovation of the system. There will be no Union Government help in this regard and this can be done with State resources as the Task Force report shows. The Lok Sabha (budget session) debate also highlighted the need and specifics of the needed educational reform in the Country in relation to education of drop-outs, scheduled castes and for employment. Another strong support for the educational reform movement comes from scientists' discussion of the NCST approach to the Science and Technology Plan. Their call is for the learning of skills and not simply of knowledge. They call for a sophisticated readaptation of Gandhian techniques to education—what we have come to call work centred, work oriented education. They also urge that science education should be made compulsory up to the school level, that there should be one pace setting school for every district to nurture talent, and the organisation of science camps and exhibitions, as this State is planning to undertake in 2 districts this year. Another advance is the decision of the Punjab State to make sports a compulsory subject in the school curriculum, wherein students will have to get 33 per cent minimum marks for promotion. Students will have a theory paper covering health, hygiene, anatomy and fundamental rules of the games as well as a practical field examination in one game. To make this innovation a success, the State budget provides the necessary funds. This important development should be followed by this State. At the university level, Madras University has introduced 3 job oriented courses for the next academic year—a 2 year degree course in journalism, the B.Sc. course in medical laboratory technology and a Master of Pharmacy course. A diploma course in education for college teachers on the basis of the the pilot experiment in Perianaickenpalayam involving one year's evening courses or a summer term full time course for college teachers has been introduced. This is a good start to improve the methodology of college teaching in the State. The next round of undergraduate and post graduate syllabus revision will be undertaken in the 1973-74 academic year and be introduced in the following year. The Vice-Chancellor of Madras University has also urged colleges to open more evening classes as one way of stabilising full time admissions and expanding out of college education—as the Task Force report urges. University structures are being debated as the Madhya Pradesh Government has introduced the University Bill expanding

the power of the chancellor to appoint the Vice-Chancellors of the 10 universities in that State, control the executive councils of the universities (12 of the members will be his nominees) and providing for student representation on the Councils. The debate now under way on the question of academic freedom is important but in the present situation of education in the Country, there are other issues of purpose, substanance and direction which have priority over structure. Another interesting innovation is the Bombay University degree course in dramatic art. It is a 3 year course in theatre techniques and world's dramatic literature and is bound to link the University world with the creative art world. It will certainly act as a stimulant to the Indian theatre movement. This State is proposing to start an Institute of Epigraphy from the next academic year. The selected students will be trained in copying epigraphs, and reconstructing art and culture of the State and Country. The Dravidian Linguistics Association is urging the Union Government to set up a research council for linguistic sciences and set up a dialect survey centre—both of great value to our Country with many languages. Whether there should be a separate council or whether linguistics should be one of the major areas of concern of ICSSR should be further examined by the ICSSR Review Committee. The Union Government which runs the Poona Film and Television Institute and for which it has a 3 year Unesco aid, is now studying, through the Khosla Committee, the details of a TV course—production, management and and processing—at the Institute.

Technical education

At the end of March, the Institute of Labour Studies for the training of workers for leadership tasks started in the guest house of the Nandambakkam Surgical Instruments Plant. The courses are aimed at identifying the roles of Government, management and trade union and the teaching staff are trade union leaders, managers and labour development officers. A recommendation of the State Planning Commission Task Force for starting an Agricultural Polytechnic in this State has been further underlined and expanded by the Indian Agricultural Universities Association's fourth convention recommending the setting up of an Institute of Agricultural Technology, Training and Education in every agricultural university and an agricultural polytechnic in every district. This is a far reaching recommendation based upon the ratio of one trained agricultural graduate for every 5,000 farmers and one animal science graduate for every 10,000 livestock. The polytechnician has two tasks—to act as the middle level technician with the mass of our illiterate farmers under the guidance of the university graduate and to teach agriculture in the comprehensive high schools. In addition the Tamil Nadu Agricultural University has a 12 year plan to train 100 graduates a year to act as agricultural high school teachers. This State is starting with one polytechnic, for the next academic year in Pondicherry (see Vol. III page 269 of the Bulletin). The number of polytechnics needs to be increased rapidly during the Fifth Plan period. The urgent need for technical training is brought out in a Punjab survey, the home of the green revolution, which reports that less than 50 per cent of the mechanics handling farm machinery are trained. 46 per cent of the owners and 52 per cent of the workers are ex-blacksmiths and carpenters, who have not been trained in repair and maintenance service. If a similar survey is made in this State, the results will be the same. There is need to run training courses for these

workers and owners in the nearest ITIs and place unemployed ITI graduates in these centres. This could be one of the functions of 100 Nehru Youth Centres being set up in 100 districts of the Country to teach the rural people literacy and the farm machine workers the needed mechanical skills (see Vol. II No. 12 pages 36 and 37).

Science

The NCST document, An Approach to the Science and Technology Plan, has now been widely debated as reported in Vol. III pages 194 and 268. The March seminar in Bangalore emphasised the importance of priorities in the Plan in reference to the Fifth Plan goals. In drafting the S & T Plan a modern information network is absolutely essential as is also a new management system. At the Calcutta seminar at the end of March, the importance of science education, of the need to develop our own technology and adapt and develop whatever technology we had to import, and the need for industry to do its minimum share at least in product development and improvement were stressed. The Madras seminar at the end of April raised several issues about the approach paper and its relation to micro realities of the State, the optimum use of R & D institutions like the IIT and engineering colleges and the divorce of the Plan from Social Science research techniques. All the Industrial representatives raised many questions as to assumptions made with regard to financing including the proposed R & D cess. There was unanimity about the need for forging links between R & D institutions, Government and the public and private sector enterprises. With regard to the problem of repetitive and costly import of technology, the Government proposes to add a rider that all importers of technology should set up the necessary R & D establishment or link themselves to an existing R & D institute in that area. The committee headed by the Director-General of CSIR is negotiating with industrialists the package of incentives that will encourage them to set up their R & D and the disincentives against too ready an import of technology unsuited to local materials and skills. This calls for greater investment in R&D by the industry over the current 7·8% of the total investment. The Minister of Industrial Development suggests that one per cent of the cost of industrial products should be invested in R & D. The Minister of Heavy Industries continuing this theme at the R & D seminar of the Engineering Association of India (western region) emphasised the link aspect, that is the continuous exchange between scientists and technologists in the firms and those in R & D organisations, and thus break down the isolation in which each group works. On the agricultural research side, the ICAR schemes for 1973-74 declare the Karnal and Bangalore institutes permanent ICAR institutes. For this State what is urgently needed is the regulation of the status of the teaching and research responsibility of the Tamil Nadu Agricultural University as set forth in Vol. III page 123. A useful breakthrough is the Roorkee Building Research Institute's demonstration that fly ash, a waste from coal based thermal plants can be used as pozzolana in the cement industry. So too the blast furnaces slag from our steel plants can be blended with portland cement. The Country's demand for cement is 25 million tonnes and current production is 15 million tonnes. By using the Country's 4 million tonnes of fly ash and 6 million tonnes of slag, cement production can be increased by 25 per cent and the shortfall considerably lessened. On the use of slag in cement, the earlier comment on its use as a fertiliser should be noted. Further to the pre-

paratory studies on India's Space programme commented on in Vol. III pages 40, 124 and 195 which calls for an outlay of Rs. 100-175 crores including a foreign exchange outlay of 35-80 crores for developing an indigenous communication satellite and Rs. 1.5 crores including Rs. 50 lakhs as foreign exchange for benefitting from earth's resources satellites, the policy issue is whether the Country can afford the former. The answer is that for the Fifth Plan we should concentrate on the resources survey techniques and work further on the more costly communication satellite. That also seems to be the NCST proposal.

Health

In a recent WHO study of 8 South East Asian countries, India comes out as having lowest per capita health expenditure in the world at less than one dollar. Given our huge population, this coefficient is not by itself worrisome, but what is disturbing is the poor delivery system and ineffective use of our existing limited supply of medical and para medical personnel and beds compared, for instance, to Mongolia and Sri Lanka. The qualitative comparison is fair and here size makes no difference. The Union Government reports that since family planning was launched upto November 1972, 12 million births have been averted, 13.41 millions consisting of 13.3 per cent of the eligible couples protected and birth rate reduced to 37.1 per thousand. The computation of the births averted needs further analysis and examination. The Estimates Committee of the Lok Sabha in its 33rd report states the Government does not have a firm population policy. Pointing out that the Country has to support 14.8 per cent of the world's population with only 2.4 per cent of the world's area and of 1.5 per cent of its income, it states that the gap between people and resources is widening—the population has grown from 21.64 per cent during 1951-61 to 24.57 per cent during 1961-71, while net national income rose by 64 per cent between 1950-66 and per capita income by 21 per cent. It calls for short term and long term birth reduction targets and physical performances to match the larger and larger financial allocations. It recommends that family planning staff be placed on a permanent footing in the States as has been done at the Centre. In this regard the minister of health in this State has suggested that district level family planning committees be formed to execute programmes continuously and not only during the annual campaign. A general planning issue that we face is the shortage of doctors on the one hand—in terms of the 1 : 3,500 doctors population ratio we are short of 40,340 doctors, our present medical population of 1,30,570 doctors gives a ratio of 1 : 4,366, we have 8,400 dentists against 19,900 needed and 82,330 nurses against 1,20,000 needed giving a doctor : nurse ratio of less than 1 : 2 against a world ratio of 1 : 6, the Medical Council of India at its 77th session speaks of a saturation of doctors' services and the need to cut back the admissions to medical colleges. The real problem is the distribution of doctors as between town and country and not one of their over supply. The problem of protein deficiency in the State and Country was discussed once more at the national symposium on Agricultural Development in Delhi in March. The general conclusion was that for Tamil Nadu and India the problem is that for both children and lactating mothers as well as the poor sector generally the point of attack is inadequate calorie intake, of which protein deficiency is a function. In the nine district survey of Tamil Nadu of 1,022 households, 49 per cent of the households were found to to be calorie deficient. In the Maharashtra

survey of 862 households 32 per cent were found to be deficient in calories. If the households had enough calories, they would have enough proteins. The Indian normal cereal-pulse based diet has sufficient protein, if there is a sufficient quantity of it. The problem is thus one of increasing the incomes of the poor majority (and reducing the over consumption of the rich minority) so that the farmer can eat enough. The quality of eating habits and composition needs also to be changed. Our average consomption of cereals is 465 grams a day against the normal minimum of 400 grams. In the rural areas the average is 490 grams and in some cases as high as 700 to 800 grams. There is need to increase the intake of vegetables and fruits like bananas and so diversify our cereal oriented diet. In the case of children small quantitites of food eaten six times a day—with puffed Bengal gram or roasted groundnuts served between the main meals—will combat protein deficiency. For the poor majority the double problem is one of chronic starvation which produces calorific and protein deficiency and the parents being out all day at work so that the feeding of the child six times becomes impossible. The child nutrition programme and centres of the Fifth Plan should deal with both these problems.

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V. Employment

1972's record of strikes, lockouts and man-days lost indicate the leeway to be made by the State and Country in industrial relations in the interest of speedier industrial growth and a peaceful society. There were 2,614 strikes and lockouts in the Country, with Maharashtra leading the way (662), followed by West Bengal 339) and Tamil Nadu (334). Gujarat which is as industrialised as Tamil Nadu had only 120 strikes and lockouts. The loss to industrial production of less than half these incidents (1,252) was Rs. 60.65 crores. More serious the mandays lost were 17.92 million against 16.55 million in 1971. The loss in the Central sphere has been declining from 2.94 million in 1970 to 1.76 millions in 1972, while that of the States was on the increase. In spite of 219 out of 300 recommendations of the National Commission on labour having been accepted by the Government, only 14 out of 935 cases were setlled by voluntary arbitration, arrears to the provident fund at 31 December 1972 amounted to the huge total of Rs. 135.85 crores involving 46,484 prosecutions. Money wages in the manufacturing sector rose by 75 per cent between 1961-72, but real wages only by 2 per cent. There is need for a comprehensive legislation to promote industrial peace through machinery and procedures to settle industrial disputes, strikes and lockouts and union recognition.

With the worsening unemployment and educated unemployment situation, innovative programmes to generate employment are increasing. As on June 30, 1972 the Union Government announcement states that 5.5 million persons were registered in employment exchanges of which 2 6 millions were educated unemployed (see Vol. III page 43 which up dates the unemployment figure to 6.45 mil[illegible] s shown in employment

exchanges on 30 September 1972). Among the innovative employment schemes the Kerala labour banks developed by the Centre of Development Studies, Trivandrum and operating under its care in Alangad and Parur in Ernakulam districts is a sound pilot for the other States. Under the scheme the panchayat identifies those to be employed and ensures their paying into the bank half the wages in the form of 3 year fixed deposits at 12½ per cent interest. Works in which 2/3 of the total cost are wages are accepted in the scheme, which is initially financed for the bank by the Government (which has appropriated Rs. 20 lakhs to start them) but once the bank chooses the right type of projects and becomes self sufficient, this loan is converted into a grant. At the end of the 3 year period, the beneficiary could receive his deferred wage either in an insurance policy or as payment of a constructed house. The merit of the scheme is that it mobilises local resources for meaningful developmental activity instead of allowing public works programmes to deteriorate into wasteful form of dole distribution. It could also be a powerful instrument for decentralised Plan implementation at the district and village level which this State is working for.

Other programmes relate to employment programmes for educated youth. The Union Ministry of Education has developed a programme to employ 1,00,000 young persons on development works to fight famine and drought at a cost of Rs. 1.38 crores this summer. Mysore has started with employing 6,000 university students in a massive relief programme in the drought hit regions of the State. Assam employed 2,500 young men in building 400 houses within 4 months in their new capital. The value of work entrusted to a person varied from Rs. 5,000 to 40,000 which was given to youth rather than to contractors. Kerala has drawn up a Rs. 5 crores programme to employ 25,000 educated young persons under the Union Government's scheme to employ this year 5 lakh persons at a cost of Rs. 100 crores provided for in the Union budget (see Vol. III pages 235 and 236 and 270). Kerala has inaugurated an automobile unit, "Encos", a cooperative enterprise of technocrats and engineers which has found employment for 700 technicians and invested Rs. 60 lakh in various units.

In the educated unemployment scheme, particularly the 5 lakhs employment scheme, special attention is being given to unemployed engineers and scientists who should also be employed this year. The wastage here is high given the unit cost of their training. The disturbing trend of increasing unemployment of post-graduate scientists of whom 7,570 registered with the exchanges in 1970, 10,114 in 1971 and 10,528 by June 1972 must be reversed. For this State as of 30 September 1972, the number of educated unemployed is 4,97,468 (and not 2,10,000 as stated by the Minister of State for Planning)—see Vol. III page 44—and as a result of the schemes presented to the Union Government Rs. 6.5 crores have been allocated out of the Rs. 100 crores Union Fund for employing engineers, diploma holders, architects and scientists. In addition 4.89 have been allocated by the Union Government for the educated unemployment programme and Rs. 2.65 crores for the crash rural unemployment scheme. There is the special problem of the 19,000 trained teachers without jobs for whom the Task Force's plan for education of the primary school drop-outs will provide a solution. In addition under the Rs. 47 lakhs special Apprenticeship Training Scheme started last year, 552 degree holders, 929 diplom holders and 969 craftsmen have been trained and are being placed. The bank are also moving to help in the employmen

ınd self employment of technicians and arm graduates. What is needed is for the mployment cell created under the Minister f Industry and the State Planning Commission to monitor this growing programme and ensure a speedy rate of execution in productive and assets creating activities.

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VI. Other Items

:SSR Review Committee

The third meeting of the Committee in 'arch in New Delhi was the occasion for e committee's exchanges and discussions ith the ICSSR Standing Disciplinary ommittees for Economics, Anthropology, ıblic Administration, Management and :ography, which together with the bruary exchanges with the 3 other sciplinary committees (see Vol. III page 1) helped the committee to assess the ate of research todate and the priorities r the future. The committee also had changes with the Directors General of ;IR and ICAR with a view of proposing ıchinery and programmes for the inter tion of the physical, agricultural, gineering and social sciences. It also t the Directors of the Indian Institute Social Sciences and Gandhian Institute Studies to examine a proposal to /elop an ICSSR network of research ıtres. Exchanges with the President, lian National Sciences Academy set the ge for a recommendation on the fessional organisation of the social nces. The Fourth meeting of the ımittee in April in Bombay was devoted eting 60 social scientists from Maha- a and Gujarat to ascertain their s on the past functioning of the ıcil and their proposals for its aiding ı more effectively in their research. ıssions with Dr. Dandekar, Dr. Dant- ı, Mr. J.R.D. Tata and a group of research users from the Reserve Bank, Government and consulting firms indicated the further directions for the council's priorities and functioning. The committee also began analysing the responses to its 4 questionnaires addressed to Heads of Social Science Departments, individual social scientists, project aid applicants and research users and the report of the consultant on the council procedures in accepting or rejecting requests. In light of all this, the committee has established a 14 point annotated agenda on the role of the ICSSR to which part of its future meetings will be devoted.

Annual Teachers Assembly:

The twentieth Annual Assembly of the 12 teacher training colleges in Madras brought together some 1,000 student teachers who are graduating this year at a meeting in mid March in the YMCA college of physical education. The occasion was used to recall Gandhiji's conception of the vocation of the teacher and the problems and prospects of the young teachers as they are setting forth on their important careers, it was also a sombre occasion because it recalled the fact that only the graduate teacher training institutions are functioning in the State. The undergraduate teachers training schools numbering over 120 are closed, in view of the unemployment situation of trained teachers referred to earlier.

Ugadi celebrations:

The Andhra Kala Samithi of the Heavy Vehicles Factory, Avadi, celebrated the Telugu New Year's day with a two day cultural festival. The Samithi is part of the Fine Arts and Cultural Society which serves the 10,000 men and women living and working in the factory estate. The are cut off by distance of over 50 kilometres from Madras and have developed a good community and cultural life of their own. Last year's celebrations had to be cancelled because of industrial unrest. This year's events recalled the close ties between Andhras and Tamils and was marked by attractive plays, music and dances from the best that Andhra Pradesh has produced. At a time when the division of the State is under active political demonstration, the cultural festival was a uniting force.

The Fifth Plan educational sector:

The steering committee of the Union Planning Commisson examined in March, the Rs. 2,200 crores education sectoral plan drafted by the commission secretariat on the basis of the work of the 14 Task Forces. The draft plan is sound, along lines of agreed priorities of work based primary education, vocationalised secondary education and qualitatively improved stabilised higher education. Its reform features are also on the right lines. Some improvements in linking in-school and out-of-school education, in incorporating a section on agricultural education, and in providing more literacy and informal education and less of formal education are to be added. Now the Union Planning Commission is circulating the plan as a guide line to the States and it will further guide the work of the Steering Committee of the Central Advisory Board of Education in June.

UNESCO National Commission:

The Executive Council of the Unesco National Commission examined the report of the Indian delegation to the 17th session of the Unesco general conference. One of the tasks to which the National Commission must address itself almost immediately is to send Unesco its suggestions for the programme for 1975-76. The delegation had made a valuable contribution to Unesco policy and programme in education, natural sciences and technology, culture and mass communication Now this work has to be followed up an areas have to be identified which th the National Commission can take ove for the international secretariat, s promoting decentralisation and som economy in overheads.

Centre of Development Studie Trivandrum;

The Union Government appointed committee of four specialists headed b the Director of the Madras Institute c Development Studies to visit the Centre c Development Studies, assess its pr gramme and recommend a grant in a from the Union Government. Tl Committee visited the Centre in mid Ap discussed with the staff its programme, i future needs in relation to its developi as a Centre undertaking relevant resear and training young specialists for Ph.D and M. Phil. courses and agreed on formula for its financing by the Union a State Governments. The Chief Minis of the State expressed himself in compl agreement with the committee's con sions.

The Fifth Plan:

The Union Planning Commission hac noted earlier, two meetings of its p of economic advisers in March and A

to examine the Approach Document and the macro model, the input-output model, and the consumption model used. The input-output tables were discussed and suggestions made for alternatives for some of the data and coefficients. Again the projections of final demand for 1978-79 might be based on and lead to three alternatives rather than the existing two. On the whole the consensus was that with the existing data, the Approach Paper presents a consistent set of programme outlines which now should be turned into policies. Some of the assumptions are politically determined but then the planning process is essentially a political process, with the planner indicating the time path and options for attaining the politically determined ends and even some of the means that are available to the political authority. At least the panel needs to bear this constraint constantly in mind because it is so easy for the economist to slip into the position of being the politcal decision maker - a temptation not always resisted at the meetings.

Asian conference on Social Scince Teaching and Research:

The conference referred to in Vol. III page 202 of the Bulletin will open on Monday 21 May 1973 at the Indian Institute of Advanced Study, Simla. Social scientists from Afghanistan, Bangla Desh, Ceylon, Indonesia, Iran, Japan, Malaysia, Mongolia, Nepal, Philippines and Thailand are attending the conference. The Indian delegation is Dr. Malcolm S. Adiseshiah (leader), Dr. Dubey, Dr. Lakdawala, Prof. Rasheed-ud-Din Khan, Prof. H. C. Ganguly and Dr. Manzur Alam.

Consultation on Tamil Nadu Science and Technology Plan:

The Tamil Nadu Science and Technology programme proposed by the Task Force on Education, Science and Technology and approved by the State Planning Commission was confronted at a consultation organised by the Commission at the end of April in Ezhilagam with R & D proposals put forth by the Task forces on Agriculture, Animal Husbandry, Fisheries, Small, Medium and large Industries, Power, Health and Education and the Approach Paper to the National Science and Technology Plan. The consultation had before it 14 papers on general issues and sectoral R & D, was attended by 20 scientists and technologists, members of the Planning Commission and representatives of the private sector, the State Government, and the NCST, Delhi and the secretaries of the relevant Task Forces. The consultation drew conclusions as to the goals, the R & D needs, the priorities, implementation machinery and finance and recommended that a 15 member committee be set up by the Commission to draft and submit to the Commission by July 31 an integrated science and technology plan for Tamil Nadu in relation to the National Plan. The committee is now at work drafting the Plan on the basis of some 100 R & D projects sugested by the Task Forces and being formulated by the scientists, and 4 working papers on R & D institutes in the State, priorities, link with users and the Plan objectives that are being prepared by consultants. The members of the committee are:

Dr. Malcolm S. Adiseshiah,
Member,
State Planning Commission,
Madras. Chairman

Prof. S. Sampath,
Deputy Director,
Indian Institute of Technology,
Madras-600036.

Dr. G. Rangaswami,
Vice-Chancellor,
Tamil Nadu Agricultural University,
Coimbatore-1.

Dr. V. Rathnasabapathy,
Dean,
Madras Veternary College,
Madras-600007.

Dr. A. Venugopal,
General Secretary
Association of Surgeons of India,
464, Poonamallee High Road,
Madras-600010.

Dr. M. R. Srinivasan,
Chief Project Engineer,
Atomic Energy Department,
Government of India,
Shastri Bhavan,
Haddows Road,
Nungambakkam, Madras-600006.

Thiru V.T. Titus,
Director of Collegiate Education,
Madras-600006.

Thiru P. Sivalingam,
Director of Technical Education,
Madras-600025.

Thiru J. K. Ahuja,
Principal Scientific Officer,
National Committee on Science Technology,
New Delhi-16.

Thiru M. Ramaiah,
Co-ordinator,
CSIR Madras Complex,
Adyar,
Madras-600020.

Thiru K. Easwaran,
Director,
Easun Engineering Company,
Madras-600001.

Dr. V. C. Kulandaiswamy,
Dean,
Post-Graduate Studies and Director Computer Centre,
Guindy Engineering College,
Madras-600025.

Thiru G. R. Rao,
Secretary,
Hindustan Chamber of Commerce,
8, Kondi Chetti Street,
Madras-600001.

Thiru M. K. Raju,
Managing Director,
Indian Pistons, Ltd.,
"Huzur Gardens",
Sembiam,
Madras-600011.

Thiru K. Venkatasubramanian,
Secretary,
Task Force on Education, Science, & Technology,
State Planning Commission,
Ezhilagam, Chepauk,
Madras-600005. ... Secretary

Seminar for Research Supervisors and Guides on Economics Research Methodology :

The Seminar (see Vol. III page 200) for research supervisors and guides from the 14 South Indian Universities is starting on Monday, the 21st May, 1973 at Karnatak University, Dharwar. The registered participants are :

Prof. K. S. Sonachalam,
Department of Economics,
Sri Venkateswara University College,
Tirupathi.

Dr. Ramachandra Nair,
Department of Economics,
Kerala University,
Kerala.

Dr. Anantharaman,
Department of Economics,
Indian Institute of Technology,
Guindy, Madras-600036.

Dr. K. S. Upadhyaya,
Lecturer in Economics,
Osmania University,
Hyderabad-7.

Dr. V. Shanmugasundaram,
Professor & Head of Department of Economics,
University of Madras, Madras-600005.

Dr. N. Srinivasaraghavan,
Department of Economics,
Sri Venkateswara University College,
Tirupathi.

Dr. T. N. Krishnan,
Department of Economics,
Kerala Uuiversity, Karivattom P.O.,
Kerala.

Dr. Yadava Reddy,
Reader in Economics,
Osmania University,
Hyderabad-7.

Dr. M. Nagaraja Rao,
Lecturer in Economics,
Osmania University,
Hyderabad-7.

Dr. T. C. A. G. Nagarajan,
Reader in Economics,
Department of Economics,
University of Madras, Madras-600005.

Dr. (Mrs.) Sarada Raju,
Reader in Economics,
University of Madras,
Madras-600005.

Dr. T. K. Meti,
Professor & Head of Department of Economics,
Karnatak University,
Dharwar-3.

Dr. G. Parthasarathy,
Head of Applied Economics Department,
Andhra University,
Waltair.

Mr. V. Lakshmana Rao,
Department of Economics,
Andhra University,
Waltair.

Dr. M. Madaiah,
Reader in Economics,
Mysore University,
Mysore-6.

Mr. S. A. Deshpande,
Department of Economics,
Nagpur University,
Nagpur.

Dr. Malcolm S. Adiseshiah,
Director,
Madras Institute of Development Studies,
74, Second Main Road, Gandhinagar,
Adyar, Madras-600020.

Mr. R. Subramaniam,
Institute of Rural Higher Education,
Gandhigram P.O.

Prof. Subramaniam Swamy,
Deenadayal Research Institute,
7-E, Jhandewala Extension,
New Delhi.

Prof. C. N. Vakil,
C/o Prof. T. K. Metti,
Karnatak University,
Dharwar-3,
Mysore.

Prof. C. B. Tigadi,
Director,
Population Centre Mysore,
Vidhana Soudha,
R. No. 341, Bangalore-7.

Dr. B. Sarveswara Rao,
Head of Economics Department,
Andhra University,
Waltair.

Dr. K. V. Ramana,
Reader in Economics,
Andhra University,
Waltair.

Mr. G. Vinayakam,
Department of Economics,
Annamalai University,
Annamalainagar, South India.

Dr. K. R. Nanekar,
Professor & Head of Department of Economics,
Nagpur University, Nagpur.

Dr. Venkatagiri Gowda,
Head of Department of Economics,
Bangalore University,
Bangalore.

Dr. K. N. Raj,
Fellow,
Centre for Development Studies,
Aakulam Road,
Ulloor, Trivandrum-11.

Dr. S. K. Goyal,
Indian Institute of Public Administration,
Indraprastha Estate,
Ring Road, New Delhi.

Dr. (Miss) Ranadive,
Professor of Economics,
Bombay University,
Bombay.

Prof. K. J. Shah,
Head of the Department of Philosophy,
Karnatak University,
Dharwar-3,
Mysore.

The 4 documents: Document 1 on Economics Research Methodology curriculum, by Dr. T. N. Krishnan, Professor of Economics, Kerala University, Trivandrum and Documents 2 and 3 on "Gaps in current research and developing new areas of knowledge in Economics" by Dr. V. Shanmugasundaram, Professor and Head of the Department of Economics, University of Madras, Madras and Dr. Gautam Mathur, Professor and Head of the Department of Economics, Osmania University. Hyderabad and Document 4 "The Problems and Means of Assistance to Supervisors and Guides" by Dr. V. Anantharaman, Professor of Industrial Management, Indian Institute of Technology, Guindy, Madras, have been circulated to the participants. The programme for the seminar is :

Monday, 21st May—Opening
9.30—10.30 a.m.

First week—May 21st to May 26th

Morning Session—9.30 a.m. to 12.30 p.m.

Monday, the 21st to Saturday, the 26th

Discussion on Dr. T. N. Krishnan's paper on 'Methodology Curriculum'

(Coffee break: 11—11.15 a.m.)

Afternoon Session—3.30 p.m. to 5.00 p.m.

Tuesday, the 22nd and Wednesday, the 23rd

Lecture discussion by Dr. (Miss) Ranadive on 'Economics Research Methodology'

Thursday, the 24th and Friday, the 25th

Lecture discussion by Dr. K. N. Raj on 'Economics Research Methodology'

Second Week—May 28th to June 2nd

Morning Session—9.30 a.m. to 12.30 p.m.

Monday, the 28th to Wednesday, the 30th

Discussion on Dr. Gautam Mathur's and Dr. V. Shanmugasundaram's papers on 'Gaps in Current Research and Developing New Areas of knowledge in Economics'

(Coffee break: 11—11.15 a.m.)

Afternoon Session—3.30 p.m. to 5.00 p.m.

Tuesday, the 29th and Wednesday, the 30th

Lecture discussion by Prof. Subramaniam Swamy on the same theme

Thursday, the 31st and Friday, the 1st June

Discussion Problems and the Assistance needed by supervisors and guides on the basis of Dr. Anantharaman's paper.

(Coffee Break: 11—11.15 am.)

Thursday, the 31st and Friday, the 1st June

Lecture discussion by Dr. S. K. Goyal on "Economics Research Methodology".

Saturday, the 2nd June: Concluding Session

Evaluation of the seminar by participants and suggestions for the future.

April Development Seminar

The paper for the April Development seminar, "Education in Tamil Nadu", by Miss Kailash Jhaveri, Sri Aurobindo Ashram, Pondicherry, together with the summary of the discussions at the seminar chaired by Mr. M. N. Rao, Secretary, Seshachalam Publishers, Madras, on Thursday, the 26th April, 1973 appears as the first article.

Second Article

Another article, "Approach to Science and Technology in the Fifth Plan" appears as the second article.

Correspondence

A comment by a reader on Prof. Sampath's paper on "Large and Medium Industries" (Vol. III pages 274-295) appears in the correspondence section.

EDUCATION IN TAMIL NADU

By

MISS KAILASH JHAVERI
Sri Aurobindo Ashram, Pondicherry

I

This wonderful world of Delight, waiting at our gates for our call to come down upon earth.

—The Mother

To know, possess, and be the divine being in an animal and egoistic consciousness, to convert our twilit or obscure physical mentality into the plenary supramental illumination, to build peace and self-existent bliss where there is only a stress of transitory satisfactions besieged by physical pain and emotional suffering, establish an infinite freedom in a world which presents itself as a group of mechanical necessities. to discover and realize the immortal life in a body subjected to death and constant mutation,—this is offered to us as the manifestation of God in Matter and the goal of Nature in her terrestrial evolution.

—Sri Aurobindo

My original proposal was to write an independent paper on Education and not to comment on the Task Force's Report on Education in Tamilnadu. So, before I received this beautiful framework, indicating the most subtle and supple hand of its master-craftsman, I asked him if I was expected to write a paper on Education from the point of view of eradication of poverty. He said: "No, you write the paper from the point of view of what is best for Tamilnadu."

So, offering my first reactions to the Report, I wrote the following letter, asking him for his advice and direction. I put before you this letter since it bears a glimpse of the light in which this paper was written and includes a part of my comment:

> "As I told you, your Report is ingenious in its guidelines, and in its framework it is so comprehensive and flexible that it is *too perfect* for any comment. Where is my place? I *search for it*, but do not find it.
>
> I note that the Report is almost noncommittal on the issues of culture and the required social changes. It does not seek to define what are the spiritual values, nor what is meant by the full personality of the child and its harmonious growth. This, I suppose, is intentional. For, one can put into it as much as one is capable of.
>
> The rest is also, I believe, the concern of sociologists, educationists, curriculum experts, administrators and other such specialists, and they will probably fill in the details according to the need of the hour and their ability to meet the situation. And though one would wish the Report to be more specific on these issues with some definite guidelines and projects, I suppose, a broad base with "carte blanche" for all is more in keeping with the needs of a constantly evolving society.

The statistical part of your Report baffles me a little. For one thing, statistics are never static. Besides, they do not seem to go deep enough to unveil the reality behind the surface data they collect, and for that very reason, they do not seem to be far-reaching enough to touch the fringe of those possibilities which lie hidden in the Future. They cannot do so until they catch hold of the most constant "variable" which remains as yet imponderable to our limited mental comprehension.

The financial aspect of education I am hardly capable of commenting upon. But I believe that the field of education being coterminous with the whole of Man and the universe around him, one can never invest enough in education. And if the full splendours of life, mind and spirit are to be educed from Man properly cultured, it must demand a total involvement on the part of society.

I believe the Report's evident emphasis is on Science and Technology, which is most welcome since we have suffered from this neglect in our country, and their place is overdue. Inhabiting the plane of Matter—this very Earth—and housed in a material envelope we cannot afford to ignore science which aims at the mastery of Matter and its full development. Science is of course important for its own sake and what we do with it is of even greater importance, but what it makes of us, I believe, is of supreme importance.

Personally therefore, I would have liked equal emphasis on the spiritual aspect of education, which is mentioned in the Report, but not made as vocal and specific. This is of course the private concern of each individual and must of necessity remain a matter of personal choice. And yet, if we are to recognize its importance for society, I feel, we have to be particular about the nature and content of this education. Also, if we are to integrate not only on the national but on the international level too, (without which total peace, total development and total education are not possible), if we are to synthesize all truths every where by the light of that Truth which is one and eternal, and which alone can find the right explanation, the right place and the right relation of each of its manifold aspects, then this education must become a conscious choice and the primary concern of all. Can we take this for granted ?

On my part, I believe, the only thing which is not covered here and which is perhaps left for me is to specify that aspect of education which seeks to make it possible for each person—provided he consciously collaborates—to bring forth from his very being and sublstance a new Man of the Future with a supramental consciousness (the Truth-consciousness) and suprasensible faculties which would be both infallible and decisive in their precision of knowledge and action. For, it is only in the Truth-consciousness that there can be a clear vision of the totality and consequently a spontaneous harmony within and without. The seed-basis of this education is certainly there in our spiritual culture, but the precise knowledge of its full flowering and fruition is evidently lost or not disclosed or not discovered.

How to introduce such a vast subject in so short a span ? Will it not be beyond the scope of this paper ? Do I need to do so when Sri Aurobindo has already done it so beautifully, so

thoroughly, so convincingly and in a language which is a mantra?

Here, I am reminded of your own message in "Let My Country Awake." And since this too rings like a mantra in my ears, what I seek to offer in the proposed paper on education is not much of a comment and a critique of your Report, but rather a complementary adjunct, bringing to light the subject and object of all development is Man so that we may never forget that supreme goal of education which is the awakening of Man'.

May we share this faith in Man and in his inviolable destiny? I seek your advice and direction and await your word."

I was advised to go ahead and prepare my paper as I liked, bearing in mind that I would be addressing an audience not familiar with Sri Aurobindo's writings and thinking. It is assumed that my comments would be educational and non-educational.

II

"In Light are joined, but sundered by severing Mind.

Stand face to face, opposite, inseparable.

Two contraries needed for his great World—Task.

Two are the Powers that hold the ends of Time;

Spirit foresees, Matter unfolds its thought."

—Savitri

"All affirmations are denied only to lead to a wider affirmation of the same Reality. All antinomies confront each other in order to recognize one Truth in their opposed aspects and embrace by the way of conflict their mutual unity."

—The Life Divine.

I take this theme because it seems urgent. And all the discussions of the seminars of this Institute since its beginning and particularly those following Dr. Pillay's paper on Student—Teacher Relationship, where the problem of Education is dealt with in the context of our present crisis in India, seem to impel it. For me, the thesis of this paper has deeper roots since my work at and with the United Nations and Unesco, where I discovered the truth of the following observation—of Sri Aurobindo which I put before you because it seems true even today:

"It is one of those vast critical moments in the life of the race when all is pressing towards change and reconstitution. The ideals of the Future, especially, the ideals of freedom, equality, commonalty, unity, are demanded to be brought from their limited field in the spiritual life or the idealism of the few and to be given some beginning of a true soul of action and bodily shape in the life of the race. But banded against any such fulfilment there are powerful obstacles, and the greatest of them come not from outside but from within. For they are the old continued impulsions and obstinate recalcitrance of mankind's past nature, the almost total subjection of his normal mind to *egoistic, vital and material* interests and ambitions which make not for union but for strife and discord, the plausibilties of the day and morrow and shuts its eyes to the conse-

quences of the day after, the habits of pretence and fiction which impel men and nations of the practical reason which looks at the possibilities to pursue and forward their own interests under the camouflage of a specious idealism, a habit made up only partly of the diplomatic hypocrisy of politicians, but much more of a general half-voluntary self-deception, and finally, the inrush of the blinder unsatisfied forces and crude imperfect idealisms to take advantage of the unrest and dissatisfaction prevalent in such times and lay hold for a while on the Life of mankind."

The present era of the world, as we know, is a stage of immense transformations. Many radical ideas are at work in the mind of humanity, seeking a reconstruction of our society in the field of education, social, economic and political institutions, and science as well as well as our religious and cultural life. The old ideas and institutions are breaking up, demanding a revolutionary or an evolutionary change and a complete reshaping of our entire life and the thinking.

However, again as Sri Aurobindo points out:

"The idealist, the thinker, the philosopher, the poet and the artist, even the moralist, all those who live much in ideas, when they come to grapple at close quarters with practical life seem to find themselves somewhat at a loss and are constantly defeated in their endeavour to govern life by their ideas. But even the man who is capable of governing his life by ideas, who recognizes, that is to say, it ought to express clearly conceived truths and principles of his being or of all beings and tries to find out or to know from others what these are, is not often capable of the highest, the free and disinterested use of his rational mind. As others are subjected to the tyranny of their interests, prejudices and passions, and are unable to think freely about them, unable to distinguish their limits or in relation to them other different and opposite ideas and the equal right of these also to existence.

"Even if all our actions are scrupulously regulated by education or law or social or political machinery, what will be achieved is a regulated pattern of mind, a fabricated pattern of lives, a cultivated pattern of conduct; but a conformity of this kind cannot change, cannot recreate the man within, it cannot carve or cut out a perfect soul, or a perfect thinking man or a perfect or growing, living being...

"This is the first truth that our creative zeal and aspiration have to learn, otherwise all our human endeavour is foredoomed to turn in a futile circle and can end only in a success that is a specious failure."

Obviously, we seek to construct systems of knowledge and systems of life by which we can arrive at some perfection of our existence. But ignorant, we cannot create Knowledge; imperfect, we cannot create a perfect society. It is impossible to change the conditions without changing the consciousness. Naturally, man has to work and learn in the conditions of the Ignorance due to the downward plunge of the Spirit into the Inconscience, taken as if for "the taste of the Ignorance" and "the joy of the adventure" of its return which he attempts by piercing through the densest to the most tenuous veil of Dark-

ness till he arrives at its ultimate borders where the final golden lid hides the luminous reaches of Knowledge and he claims them.

My own work, studies and experience lead me to affirm that all our problems arise because we do not apply our rational intelligence to the whole of life, to its principle, to its machinery, and most of all, to the powers which drive the machine.

The thesis of this paper therefore bears an oft-repeated theme conveyed in varied hues in my letters and comments to our Director, who wrote to me once, saying: "I believe in the supremacy of the Spirit over Matter, but for that very reason, I am a hard-headed materialist."

My only answer to this could be: "I believe in the fullness of the material life and its rich splendours, but for that very reason I am a spiritualist".

However, I have come to the conclusion that both being the co-relative terms of the same Reality, their rapproachment is inevitable and must end in a complete integration.

So he is subjected to the tyranny of ideas. Indeed, he turns his ideas into interests, obscures them with this prejudices and passions.

Undoubtedly, the economic development of the country is our necessary concern. Poverty is a symbol of an unjust and diseased society, a scandal which must be removed. And the Report provides an excellent basis for bringing back our Society to a perfect order so that all may have an equal opportunity for education, work and growth of human personality and none may remain illiterate, uneducated, uncultured, unemployed and poor in means and merits unless he chooses to. And yet, all, all will depend upon the degree of consciousness, sincerity and will of those who administer and execute this programme as much as upon those who participate in it.

I am therefore dealing with that part of the Report which is not so vocal, but which is referred to in the first three objectives of the system of Education, Science and Technology in the Perspective Plan of Tamilnadu. For, they together, I believe, hold the key to the awakening of Man and the future development of our society in all the fields of our activities on a secure basis, and therefore, to the implementation of the programme.

In my view, all the three objectives are each a part of the others. For, the essential character of our culture is spirituality which embraces the whole of life in its fullness. For us, our daily life and our social existence, our art, music, science, philosophy—all life is an opportunity to discover and manifest the truth of our being.

These objectives are as follows:

Development of the personality of the child and its discrete and harmonious growth as a member of a group bearing on its affective life and work experience;

Understanding of the culture and history of the State, the country and the world;

Instruction in the moral and spiritual values of the country*.

I must admit that I am not aware of the content and the method of education in Tamilnadu for the fulfilment of these objectives and I should have perhaps consulted the curricula and syllabi and the departments concerned prior to this presentation. But I take the crisis in education and in our society which is often too vividly portrayed in our discussions and in the newspapers as an index to a defective and incomplete education.

For "what is in question in the last analysis is the doctrine of man—his nature and destiny. And this is a question which is particularly appropriate to the university and above all to UNESCO. For, both are established fundamentally in service of the human spirit, and they have no mission other than this spiritual. All else is consequential and subsidiary."

What I wish to present here therefore is the doctrine of Man, his nature and his destiny with a hope that he may find in it the possibility of his self-fulfilment and world-fulfilment. Perhaps, the keen perception of the Report—"people do not want for their education, Science and Technology more of the same; they want a change for better results"—may find some justification for it.

So, may I have the honour to chime the bells and add my voice to the voices of the great to say with them:

"Let my Country Awake."

III

Some day surely,
The world too shall be saved from Death by Love.

—Savitri,

I purify the earth and heaven by Truth.

—Rig Veda, I. 133.1.

Arise, awake, O immortal! Light has come, Strength has come, Bliss has come. Let us create a race divine.

—Rig Veda

We all accept that "the centre of all teaching and learning is Man." It is natural, therefore, to seek first to fully know what Man is, his psychology, the dimensions of his personality, the possibility of his further evolution and his destiny; as much as his relationship with the world around him so that we may know the problems and difficulties of his growth, the causes of his frictions and and their cure, his needs and hopes and aspirations and the way of their fulfilment.

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* Here, I would like to suggest a little clarification:

Instruction in moral values can be given but not in spirtual values. For, spirituality is in its essence an awakening to the inner Reality of our being And, the method of spirituality is purely Yogic. Nothing short of Yoga (by which I mean the union with the Reality, the essence, the Spirit) can bring about the *realization* of the spiritual values. As a matter of fact, what are to us values become the natural aspects of the spontaneous mode of living for a spiritual being. For spirituality fulfills itself by freedom.

Morality, on the other hand, is an attempt to control and guide our life, its desires and impulses by a *mental* governance on the basis of the standards of conduct, uniformly laid down for the collectivity. However, human values of truth and error, good and bad, right and wrong, virtue and sin, are always relative and hence always *uncertain* in their power to effectively direct our life.

If the whole life is the field of his experience and knowledge and growth and becoming, it is equally important to know what we mean by life and when it is fully lived. If the supreme goal of education is the awakening of Man, it is imperative to know what this awakening implies and how best it can be realized.

As for Development, here too, I believe philosophy is that realm of knowledge which may help us in deciding upon the content of education and in devising the means and methods for the achievement of the true aim of education. I mean by philosophy a science of Reality which is immanent in the universe and yet above it as not yet fully manifest, but constantly in the process of manifesting or evolving or becoming in the universe.

For each man the immediate aim of his life and education is different and must be different. However, since man is made in the image of God, he possesses a more developed psychic entity than the preceding species and more, he being conscious of his uniqueness, suffers from the divine discontent for not being what he should be. This, I believe, gives us the key to the ultimate or the true aim of education,

It is true that man's life and growth are for the sake of the community, state, nation or the world at large. But he can help them by his own life and growth only by being himself freely and not by obeying any authority outside him as a slave. The liberty claimed by the individual, community, state and nation is not a merely egoistic demand, however egoistically or with whatever mis-application it may advance. It is the divine instinct in Man and nation. For without freedom man cannot search, experiment, experience, know and grow into his selfhood and become a divine being, fully conscious of the Truth.

But Man, as we know, is constituted of many different parts,—physical, vital, mental, psychic, spiritual—each having its own demands and personality often conflicting with the others. The crisis we witness today is the result of the fragmentation of Man and his life. "Man is in his self a unique Person, but he is also in his manifestation of self a multi-person; he will never succeed in being master of himself until the Person imposes itself on his multipersonality and governs it; But this can only be imperfectly done by the surface mental will and reason; it can be perfectly done only if he goes within and finds whatever central being is by its predominant influence at the head of all his expression and action. In inmost truth it is his soul that is this central being, but in outer fact it is often one or the other of the part beings in him that rules and this representative of the soul, this deputy self he can mistake for the inmost soul principle." *

Then, there are planes of consciousness which influence and determine his thoughts, feelings and actions over which he has no control. The difficulties and problems arise because he is not fully conscious of himself and all the parts of his being are not harmoniously developed and integrated into one being, nor can the mental consciousness—even in its highest capacity—help him in this task. Unfortunately, when he turns to his ethical and moral consciousness, they too fail him miserably, and naturally so, because ethics and morality are still of the mind and its limited range of vision and understanding.

So long as the secrets of his deeper self and total nature are not revealed to him due to his surface concentration and

* The Life Divine, p. 798.

externalizing consciousness, man moves with a wall of defence which becomes a wall of obscuration and he remains ignorant of his self and the world, and equally incapable of self-fulfilment and world-fulfilment. Ignorance is nothing but the absence of the divine eye of perception which gives the vision of the Truth.

It is important therefore to remember that "Man is not just a living body, developed by physical nature with certain propensities, an ego and a mind to the satisfaction of which his life and education must be turned, nor is he merely a social and rational animal or a political and economic being." These are no doubt aspects of man and conditions must be created to train and develop these aspects so as to make him an efficient and useful or productive member of society. But these are the outward things, not the whole of the real Man. Behind all these aspects is his living soul, — "an inextinguishable spark of the supreme Fire" — of which these are to be seen as powers. And unless Man is awakened to the light of his soul, these powers can and will be misused as we see everywhere.

Man, not having all the different parts of his being equally developed and being unaware of the leader of his march — the Spirit — he is often at war with himself and a helpless victim to the conflicting influence of the forces outside himself. Man is therefore a divided being in search of integration. What he secretly seeks is an environment or the force of consciousness which can help him to develop freely and fully all the parts of his being in order to manifest their powers to the full extent of their possibility, according to the law of his being in an integrated and harmonious way. However, it is only when he awakens to the light of his soul and rises to the supramental consciousness in which there can be no place for ignorance and division that he can fully integrate and fulfil himself.

As Teilhard de Chardin points out: "Ce que l 'homme attend a ce moment et ce qu'il mourrait de ne pas trauver dans les choses, c'est un aliment pour nourrir en lui la passion du plus etre."

This explains the evolutionary urge of the mental being to ascend to the higher stage of consciousness which Sri Aurobindo terms the Supramental Consciousness or the Truth-Consciousness. For, this consciousness is a state of knowledge and will at once with a clear vision of the totality and the power to effectuate its vision. It is also the unifying consciousness, because it views all things in a multiple unity as well as in their discrete parts. It has thus the capacity to embrace all possibilities not known to the mind but without any error or groping or confusion, because it can perceive each potentiality in its proper force, essential necessity, right relation with the others and the time, place and circumstance, both of its gradual and its ultimate realization. There is a spontaneous harmony and unity of all knowledge and of all aspects of the Truth in this consciousness, because it is a Truth-Consciousness, creatrix of the world.

This, I believe, is the crux of our revolutions. For, the central force of any revolution—social, political, industrial or economic, religious, cultural, educational, scientific or any other, — is always spiritual. It silently works behind the scene, seeking to awaken us to the urgent need of transformation of our egocentric human psychology so that we may become the true Person and build a perfect society. For, the perfection of the individual is incomplete without it.

Nature uses intellectual knowledge and practical action to elicit from us an

attempt to know more about ourselves and to grow into that which is not as yet actualized. Through the study of arts, aesthetics, humanities and sciences, through all knowledge, love and action, Nature offers us manifold opportunities to train our sensibilities and faculties needed for this knowledge. The uniqueness of this individual depends upon the extent to which he can establish coherent and purposeful relationships with his objects of knowledge.

Life itself is the field of education. But the ultimates of life are spiritual and hence through all knowledge it seeks consciously or unconsciously or half-consciously, self-knowledge and world-knowledge. For, self-knowledge alone can give the luminous guidance and mastery of its own movements. *It is only when it finds within itself the inner self and Spirit and in obedience to it, can govern its own steps* that it can have the illumined will and the unerring leadership, absolute freedom, governed by inner discipline, absolute power, controlled by the joy of oneness.

We, in India, possess the knowledge of Man in his totality, the knowledge which can not only save humanity from chaos, disintegration and the impending doom but which can bring about a reign of peace and joy on earth. It has been handed down to us through various schools of Yoga and even perfected recently by Sri Aurobindo into a system of the Integral Yoga incorporating the knowledge of the new element of evolution which can lead us beyond the fumbling mental consciousness into the light of the Truth-Consciousness where Man is perfected and universalized.

This is to say that renovation in education is not enough. There must be a real reconstruction or transformation of human nature if it is to satisfy our aspiration for the kingdom of Heaven upon earth, *here and now*. This must be possible since it is the Eternal Perfection that is moulding us into its own image. And if Man has "fallen" from his original status of oneness with God, what we urgently need is the kind of education which can resurrect him from his "fall" or transform him and help him to regain his innate godhead and supreme perfection Evidently he has that power of self-transcendence or self-identity within himself. And this alone can be justification of his existence upon earth. This possibility, I believe, is the secret enigma, and hence the injunction of all sages throughout the ages: "Know thyself."

"...if man's purpose, as I believe, is to extend the limitless horizon of his mind and soul, to move forward from man the animal to man, the divine, there can be no interregnum, no hiatus in his upward, onward march."

The framework of the Report is as comprehensive as the Infinite itself and provides for flexibility of approach and free decision at each stage of our growth. And yet, in a society of rapid growth and constant flux, if we are to look for a solid basis of peace and security, we must know and seize upon that lever of control within us and this education may become a necessary concern of all of us.

I suggest therefore the following additional projects.

(i) an international centre for the studies in the evolution of consciousness and its manifest forms,

(ii) an international centre for the studies in the realization of Human Unity,

(iii) an international centre for the studies in the different cultures of the world and the possibilities of their integration,

(iv) an international centre for the studies in the integration of all knowledge, and

(v) an international centre for the studies in self-perfection.

IV

Towards A Learning Society

(A Plan for Education, Science and Technology)
1972-1984

In Retrospect, the education in Tamilnadu portrays a very impressive all-round improvement, both quantitatively and qualitatively.

And yet, there is evidently a lack of interest in education, resulting in stagnation or drop-outs at all levels, particularly among girls. The primary factor responsible for this wastage is, as revealed in this Report, the poor economic condition at home and a defective education. For, in spite of free education given upto the P.U.C. level, there is a 50 per cent dropout even at the primary level.

The Report points out several other factors or lacunae in the system of education, such as outdated curricula, outdated teaching and learning techniques, inadequate and inefficient libraries, outdated examination systems, outdated formal qualification demands of the employment market, all of which cause and enhance the wastage.

The Perspective Plan proposes to eradicate this wastage by taking the following steps : (i) equating the right to education with his right to employment, (ii) providing multiple entry, exit and re-entry points at school, (iii) providing a new and intensive scientific research and technology programme, (iv) giving special attention to the promotion of Tamil culture at all levels and forms of education, both in its own interest and as a force of Tamil development.

The Plan recommends a reduction and re-deployment in the educational expenditures. It outlines a number of projects for the fulfilment of the basic objectives which remain the same as in the preceding system of education with the addition of a fresh and major objective which will relate the right to education with the right to employment and also relate the various stages of the education and training system to the graded skill demands of society.

The objectives of the system of Education, Science and Technology in the State have been listed on pp. sixteen to twenty of the Task Force Report.

The Plan provides a detailed programme with guidelines for its execution. On my part, I am unable to see a more perfect frame work than what the plan provides. My comments and suggestions are therefore only meant to be some little stimulants on the way.

V

Some comments and suggestions

p.16. "to relate the various stages of education and training system to the graded skill demands of society."

This is to put the cart before the horse. There must be a natural harmony between the aspiration of the student and the needs of society. However, since we have entered an age of global synthesis, I believe, we must give priority to the aptitudes and aspirations of students. For, there is

enough of everything in our country and the world at large, but the tragedy is that things are not in their place and people are not in their place. All problems are therefore inter—related and no solution can be effective if it does not take a larger view of the world and the future possibilities. "No individual person or nation can develop and prosper unless all those around him do so also, unless all strive together to reach the common goal of peace and a better life for the peoples of the world."

What we need is a programme of education for the realization of human unity which is a fact, so that it would make it possible for us to have a free exchange of resources and manpower between states and nations. We need not immolate the individual to the needs of society which can never be static since they must change with the learning of the individuals who compose it. Besides, it is always the exceptional individual who determines the growth of society. It is also possible that the individual may have outgrown the scope offered by society or he may be out for a new adventure. The educational opportunities must offer him a free choice of courses and action to suit his own predilections. That seems to be the best way to add to the richness of society.

p.16 2.3. I believe all education must be a free education at all levels, but available to only those who thirst for it and merit it.

State Council of Educational Research and Training

The tasks set up for the Council are enormous and will demand a dedicated, responsible and able staff with insight, vision, integrity, courage and will to execute them.

The democratization and autonomy in the programme and administration are important but should perhaps be further democratized by including the student body for keeping the governing council abreast of their needs and aspirations.

Science and Technology

The importance given to Science and Technology is rather modest. All this is needed not only to improve our standards of living but because the spirit of science is essential for the full development of the individual's personality, inasmuch as it instills in us a habit of patient and persistent enquiry and research, intellectual honesty and rectitude, insistence for scrupulosity, accuracy and an indefatigable demand for perfection.

I would like to suggest a further integration of supra-physical sciences with the physical sciences for a complete mastery of the material universe. Cross—fertilization between different disciplines is responsible for much advance in our knowledge. We judge the perfection of a given system of knowledge by the power of its penetration and capacity to synthetise other systems of knowledge. This may help us to arrive at a perfect equilibrium and solidarity by a process of convergence.

The history of science shows recurrent cycles of differentiation and specialization followed by re-integrations on a higher level—we tend to move from unity to diversity and further by inter—penetration to a greater pattern of complex oneness. Specialization in any field is perhaps necessary for the mastery of life and the detailed study in depth of any particular subject. But unless it is con

plemented by other disciplines, it may miss the certitude and the joy of the totality of approach.

Teaching Methods:

Teaching methods and learning abilities must go hand-in-hand, taking into account the forces which affect the actualisation of what is potentially there in the individual students. For, I believe, we all know that nothing can be taught unless it is relevant to one's life or unless one has aptitude and interest in the subject. The fault may also lie with the teacher who cannot make the subject intersting if he himself is not keen about it, or he may not have the art of teaching. The best method of teaching is that which makes learning efficient and pleasant, so that it is received, understood, assimilated and retained. The learning technique too must change. For, facts have no meaning by themselves. It is only when they are interpreted in the light of our experience that they assume some meaning and become relevant. It is only when they become means to understand ourselves that they become intersting.

We all accept that an educated man is not synonymous with a well-informed, knowledgeable man, however clever he may be. For, brain—washing and indoctrination do not produce knowledge. So, if we use the teaching machines as advocated by some modern educationists, we have to ascertain whether this "push—button" education and "intellectual bottle—feeding" would really answer to the needs of the students as growing souls. For, the need of communication, intellectual sharing and stimulation through a personal relationship is equally important if we are not to produce islands of automatons, or "the dry, dull, diligent, pedantic, uninspired, scholarly book-worm or laboratory worker." Teaching methods will depend upon the objectives set for education by our society and must vary according to the age, interest and capacity to learn. And it may include group discussions, seminars, tutorial methods, radio-courses, yoga meditation or any other method to suit the needs of the individuals.

The teacher may prepare the resource material which may be relevant to the student's interest or take the class spontaneously to suit the need of the hour. Through questions and answers, through proposing thesis, antithesis and synthesis, through experiments and manipulation, through inter-relation and integration of whatever is learned, through a challenge, the teacher may ensure in his students habits of self-study, originality and fruitful understanding.

It is only when we take education as life in pursuit of the Truth in all its manifold aspects and a constant research for the harmonisation of these aspects, however disparate, opposite, contradictory or contrary that life becomes an endless adventure of consciousness into the Unknown, probing into its mysteries to constantly renew and enrich itself. For this, all methods and means are good and one can learn from anyone and anywhere—even from a child, a flower, a stone. "For, ultimately, there is only one Teacher, the supreme Lord."

Examination Reforms:

They are always welcome. There is need to evaluate, but it means that tests in any form are obsolete unless they are spontaneously arranged by circumstances. What is important in evaluating any person's worth is his ability for concentration, perseverance, comprehension, organization, imagination, innovation, degree of consciousness, power of logic, power of abstract thought, ability to go beyond reason, intuition, degree of

flexibility in thinking, synthetizing capacity, aesthetic ability, skill, thirst for perfection, originality, power of expression, courage, etc. Who can judge all this? And how?

There are many other factors which must be taken into consideration before evaluating the capacity of any individual. They may be personal, environmental, or circumstantial. The thinking and logical fallacies on the part of the examiner, personal bias, lack of time or interest on the part of the teacher, his personality, over-generalization in thought and ideas, etc. play their role too.

The uniqueness of any individual depends upon how he chooses to perceive facts and to react to them. And this intervening "variable" is never the same for any two individuals unless they are on the same level of consciousness.

The intrinsic value of any person is tested by his spontaneous reactions and the right handling of a situation. What we need is not tests and examinations, but education which gives a right attitude towards knowledge.

If the students study at the end of the year instead of studying steadily throughout the year, it must be the fault of education, its content and method as well as of the environment—physical and human. The exclusive importance given to career, success, money and social status, must be replaced by inculcating the spirit of knowledge, the thirst for truth, the joy of the effort, and the quality of absolute sincerity and transparence.

The qualities we cherish and would like to have in the students and teachers and the country and the whole world are precisely the qualities of an Aryan, not in the racial sense. For, the word aryan is derived from the root, "Ar," to plough. Another meaning given to "Ar" is strength or valour. "We fight to win sublime wisdom, therefore men call us warriors." The Aryan combines in himself the brahmin's incessant thirst for knowledge, perseverence, purity and integrity of character, the kshatriya's ardour and nobility, courage and honour, the vaishya's enterprise, industry, skill and generosity and the shudra's self-abnegation, humilty and loving service.

I believe if education is to yield its its results even on the material plane, these qualities are essential for the individual's self-perfection and for collective progress. And the most essential of all qualities is the joy of the effort. For, life is effort, it is movement which must continue towards greater and greater perfection in knowledge, in work, in love and beauty and harmony, in service.

And unless we break with the habits of the past, our mental reservations or vital biases and preferences, our social conventions, our narrow and stifling interests, there is not much hope for advancement.

This is the role of spiritual education—not the spirituality which calls for an escape from life, but the spirituality which makes life a beautiful adventure of consciousness and embraces it in all its fullness.

Girls' Education:

I feel that this segregationist attitude of our society in relation to boys and girls as far as education is concerned is harmful for the full growth of the human personality. Besides, from the point of view of knowledge and the search after the truth, both have the same needs and aspirations. I believe co-education at all levels from the kindergarten stage onwards would be more helpful in developing a healthy attitude towards the problem of

sex and it may even add to the richness and diversity of life.

What we need therefore is not the segregated schools but education for the parents and community which have an unhealthy attitude in this matter.

Equalizing educational opportunities and attainments :

I feel that the opportunities should be given to everyone for his free growth and development. But absolute equality does not seem either possible or desirable. "Men are born equal in the sense that they are one in their origin and being, one in their general law of existences." and therefore, they must be treated with equal understanding. But since each one has his own unique line of development and law of variation, according to the degree of the growth of consciousness that each individual must be treated specially, though in a way that makes the difference inoffensive.

Grades :

Usually, grades are decided according to the age and the timetables which are fixed for each grade. But this is an open issue. For, neither the interest of the students, nor their ability are the same at any particular age. And unless it is possible to manage a system where a student can be, for example, in Grade II for his geography, Grade IV for his mathematics, Grade VII for his language, etc., this standardization by grades would be arbitrary and hence a wastage. Neither the rhythm of learning, nor the interests are the same at any particular age. And unless each student is taken individually as far as possible, there would be a danger of boredom, or a dullness and a slackening. If the students are allowed to teach the lower grades even while they are themselves studying, we may achieve a good ratio between students and teachers. This may offer a profitable challenge, test and experience to the student concerning what he himself knows. This may also prevent the necessity of lowering the class to the level of mediocrity. Also, it must be remembered that wisdom does not depend on age, since the age of the soul is always different from the physical age. Those who have the capacity for a sustained concentration, effort and assimilation and wish to know more, must be given a rapid push. Otherwise, they would find the lessons slow and their energy would be misdirected. The uniform and timed programme, I believe, inhibits the phenomenon of genius.

Buildings :

They must be like temples, clean and beautiful, saturated with peace, calm, light and freshness. They must be surrounded by beautiful gardens, water-fountains and green lawns. The place of education and its environment must be physically and humanly beautiful in form and spirit so that it may constantly attract and inspire the students. Our universities should be on the banks of a river or an ocean, or on hillocks and mountains, open on all sides, so that they may invite and inspire the students to move onward and upward in an ever-widening spiral with their gaze always fixed on the Sun of Truth.

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Summary of Discussion

In the discussion of the paper at the seminar in the seminar room at the Madras Institute of Development Studies on April 26th under the chairmanship of Mr. M. N. Rao, Secretary and Partner, Messers. Seshachalam & Company, Madras, the author said that the paper was complete in itself and she felt that it required no introduction. It was not an evaluation of the Task Force Report on Education, Science and Technology, but presented the concepts of education as expounded in the philosophical writings of Sri Aurobindo which were the guiding principles of the educational centre at Auroville. The paper was in essence meant as a complement underlining the need for an individual to know himself if education was ultimately to achieve its aim of awakening man to his divine heritage,

The discussion commenced with an analysis of the approach and objectives of the Task Force Report. The Perspective Education Plan for Tamil Nadu is primarily concerned with, first, in primary education, literacy and reduction of wastage due to drop-outs and stagnation; second, manpower planning at secondary and higher levels of education; third, provision of multiple points of re-entry at various stages of the educational system; fourth, largely self-financed education at collegiate and university levels. The report correlated education and economic planning avoiding all philosophical digression. While recognising by implication the potential value of human resources it does not deal with the formal study of disciplines. Further, there is a detailed plan for the growth of science and technology. Another aspect covered is the reform of the existing examination system.

An opinion was expressed in favour of moral instruction in schools. The distinction between moral and spiritual values, however, was not clearly expressed. Further. a given set of values may not be acceptable to the community as a whole. The area of personal beliefs and value judgements is a very sensitive one and external impositions, however well meant, will not be viewed kindly.

On the issue of co-education mentioned in the paper, it was pointed out that the Task Force Report did not contain any comment. It was mainly concerned with the content of education and its improvement as an issue of greater importance. In considering the high drop-out rate given in the Task Force Report, it was suggested that existing legislation on minimum working age at state and national levels should be more strictly enforced as in the I.L.O. convention. While the influence of ideal and attractive surroundings on the growing child was undeniable, in terms of current resources the environmental facilities and design for education as outlined in the seminar paper are counsels of perfection. Efforts have to be directed towards the basic goals of achievement of functional literacy and employment oriented education and the abolition of poverty.

In this context the policy of free education up to the pre-university level was described as the result of rivalries between political parties without a widespread demand for it from the community. A review of the existing system was necessary so that the value of education as an investment was realised without denying it on economic grounds to those with genuine aptitudes and desire.

The suggestion made in the paper for the creation of an international institute with a new approach to human relationship and the explicit objective of carrying out studies in realization, culture, unity and knowledge met with appreciation. The need for an understanding in depth of national culture and values is however a pre-requisite.

THE FIFTH PLAN APPRORCH TO SCIENCE AND TECHNOLOGY*

A Challenging Moment :

With the issue of the document 'An Approach to the Science and Technology plan', I believe that scientists face the same kind of challenge to action as the Country faces with the presentation of the document 'Approach to the Fifth plan' by the Union planning Commission. In the affairs of men as of nations there come such moments of rare and awesome significance which if not seized upon would mean that history will simply pass them by. We are now faced with such a concatenation of important events in the science and technology areas. First we have a Governmental commitment at the highest level to harness our scientific and technological potential to meet the dual Fifth plan objective of removal of poverty and attainment of economic self—reliance. That commitment is embodied in the work and mission of all of India's Prime Ministers from the time of Jawaharlal Nehru who have been and are the President of our top science councils, in the untiring and irreversible pursuit for a scientific policy and relevant R & D programmes by Mr. C. Subramaniam who has happily remained Minister of Science and Technology, and in the unlimited encouragement and leeway that he has given science and scientists to produce the policy and programme since he has assumed this responsibility to the point, where as I declared from the platform at this Institute's last Convocation, our scientists are being given a last but all-out magnificent chance to come through.

That they will come through, I hope and trust. The hope rests on the first sucessful step taken by the scientific community in the dimensions of the document 'An Approach to the Science and Technology Plan' that they have made available to us. We should be profoundly grateful to the National Committee on Science and Technology for this impressive effort. And the thrust of the document is the reason for our trust in the scientific community. That thrust is the harnessing of science and technology to our Fifth Plan high stakes of providing the minimum needs of the people, achieving self—reliance, dealing with issues involved in import of foreign technology and ensuring fullest use of the country's scientific and technological resources.

The Science and Technology Plan :

The thirteen areas on which 24 panels are at work comprise the Science and Technology Plan and are derived from a micro—analysis of the Fourth Plan performance of the economy and the Fifth Plan projections and an integrated deployment of our scientific and technological resources. The areas are all problem—oriented and multidisciplinary as is the case with all R & D programmes. They cover :

(a) increasing the agricultural output calling for in particular genetics application for better yield varieties and photosynthetic efficiency and crop production physiology with particular reference to dry

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* Extracts from keynote address delivered by Dr. Malcolm S. Adiseshiah to the Regional Seminar of the National Committee on Science and Technology, at the Indian Institute of Technology, Madras, on 27th April, 1973.

farming, pulses and oil seeds for both increasing our food supply and combating our protein calorie malnutrition; (b) augmenting milk and fish production through developing suitable dairy animals and their feeding, and biological studies of our seas and water sheds and improved fishing technology; (c) increasing textiles production through research on cotton and newer types of manmade fibres; (d) more effective health and family planning programmes involving use of known technologies for the eradiction of communicable diseases, developing our own physio-chemical and social technologies for a crash family planning programme and an R & D effort on a workable nutrition and health protection delivery system, (e) improved and increased rural and urban housing tied in with land use and transportation net-works, calling for research on low-cost housing and environmental upgrading generally; (f) urgently needed expanding energy resources calling for R & D programmes in high-grade and even more important our abundant low-grade coal utilisation, soft coke carbonisation, reducing our dependence on oil (75 per cent of which is imported and whose international market is hardening daily), in electricity, where we will face a large shortfall in the Fifth Plan target of doubling our generating capacity which even then will leave us with a per capita consumption of 200 KW hours compared to a world average of 1,300 KW hours per capita, in indianising our nuclear technology and launching quick-yield programmes in unconventional energy sources —solar, tidal, wind, chemical and geothermal; (g) development of our natural resources involving investigation of the ground water system, accelerated mineral surveys and development of copper, lead and zinc in which we are well endowed and exploration of our continental shelf; (h) increased production of iron and steel, copper, zinc and coal calling for survey and R & D programmes in alloy steel, sponge iron and the needed machinery and equipment; (i) fuller capacity use in our heavy engineering industries calling for objective-oriented research and a design and development effort; (j) increasing and updating the petro-chemical and fertiliser complexes, calling for research in polymers and elastomers, new techniques in fertiliser use and design engineering; (k) accelerating and improving the engineering industry performance calling for research on substitutes for conventional materials and new designs and innovations; (l) breaking the transportion bottlenecks through use of systems approach, operations research and development of equipment and materials not locally available; (m) the promotion and operation of national programmes in the new emerging technologies that the Fifth Plan calls for in such areas as desalination, biological control of pests, solar energy utilisation and (n) a specific use of space technology in regard to resources survey and mass education and extension.

Strategy and Policies:

This outline of the priorities for the National Science and Technology Plan is supported by a proposed strategy and the requisite policies. A strategy is a consistent set of policies. The policies are the means of attaining the stated objectives. Thus while the strategy must be a single consistent frame, the policies and policy instruments must be multiple. A single policy or policy instrument cannot attain multiple objectives. In this important section of strategy and policy, the strategy of linking science and technology to the Fifth Plan objectives and programme is sound. So too are the four-fold policies—the tie-in, the choice of technology, the employment of scientists and finance and management. There is

perhaps a little too much verbiage here and certainly the introduction contains questionable *obiter dicta* or too obvious generalisations of a kind not normally associated with scientific documents. The inventory of economic manpower, social, ecological and cultural policies of the Country as governing the matching or mismatching of the supply of and demand for science and technology is a little too much like the olden belief of the sun revolving around the earth and causing all of earth's ills. What is missing in this document is a section on the constraints embodied in the bad or poor performance of scientists and technologists in the country and therefore of our science and technology. The constraints listed are exogenous—those that flow from factors external to science and scientists. But there are endogenous constraints—those caused by our scientists and technologists. They should have been identified. As an economist, my starting point for planning is the establishment, as completely as possible, of the constraints to any Plan. It is only then that the Plan can be realistic and effective, realistic because it will be based on some continuing constraints, and effective because it will be programmed to overcome some or many of them. Some of the social *obiter dicta* about scientists and society ending with the slogan that there is more to science policy than policies for science are unproved, overly cryptic and seem imported and are not necessary anyway to this challenging document with its consistent policies and priority programme outlines.

Some Issues for Discussion :

The purpose of this approach paper is set forth with clarity in Mr. Subramaniam's foreword where he says: The NCST is deeply conscious, however, that it is not the repository of all the wisdom on the issues involved ; nor does it envisage that current thinking on these issues will not undergo modification and change. Accordingly the ideas presented in this document are offered for public discussion and debate."... ....And so as we are here to debate the ideas in the approach paper, as has been done at the Seminars in Bombay, Bangalore, Kanpur, Calcutta and Delhi, I start off by raising some issues which may be of help during the further elaboration of the programme.

Spatial Application :

The approach paper suggests that the Plan and its projects will be developed by using the technique of micro-analysis of our problems and the integrated deployment of science and technology. Basically this is sound and should be both the starting point and end point of the Plan. Whether it be wheat production that is grown mainly in three States or fisheries development involving only seven States, or coal and iron ore increase which must come from four States, the problem has to be looked at Country-wise by sector end problem, and the R&D effort similarly planned globally for the Country. In this process of the Science and Technology Plan formulation, I would, however, like to interpose an intermediate step. The micro-analysis technique should not be only subsector or sector or problem wise, but also State and space-wise. In this State, the State Planning Commission has established the following eight R&D priorities for increased agricultural production suited to the climatic and soil requirements of this State during the Fifth Plan : research on (a) rainfed agriculture, (b) new cropping patterns, (c) agro based industries, (d) horticultural crops and hills development, (e) soil and water management, (f) seed technology, (g) extension methodology and (h) farm management and marketing. The first area of the National Plan referring to R&D program-

mes for increased and improved agricultural production must at the mid-point of their elaboration rest on and comprehend such State or spatial R&D needs, flowing from their envisaged agricultural and allied activities for the Fifth Plan. This synthetic middle process of State and spatial priorities and research which starts with micro-analysis in subject areas and ends with integrated programmes seems to be lacking. For filling this gap, each of the States should now establish its R&D priorities so that the National Plan can also be a true synthesis of them.

Or take the manufacturing sector. In the first four Plans, this State, without an industrial raw material base and with limited capital — fixed and working— raised from within the State, has attained the fourth most advanced position in the Country in a wide range of production— metal and metallic products; chemicals; agricultural and farm equipment; mechanical and electrical engineering products; railway coaches and automobiles. In this achievement the State sector invested Rs. 17.45 crores, the joint sector opening up with the Rs. 73.5 crores SPIC project, and central investments in 11 units ranging from Neyveli and ICF to Madras Refineries and Madras Fertilisers with a total investment of Rs. 377 crores and the private sector the rest. For the Fifth and Sixth Plan periods, the State Planning Commission is proposing accelerated advance in fourteen groups of industries, Metal based (Rs. 175 crores) Automobile and allied units (Rs. 150 crores), Chemical and allied industries (Rs. 208 crores), Cement, Ceramics, Refractories and Glass (Rs. 55 crores), Electricals (Rs. 80 crores), Electronics (Rs. 150 crores), Textiles (Rs. 235 crores), Handloom (Rs. 60 crores), Sugar Mills (Rs. 48 crores), Paper (Rs. 150 crores), Alchohol (Rs. 5 crores), Vanaspati (Rs. 10 crores), Rice milling (Rs. 35 crores), and Fruit processing (Rs. 5 crores). It will be noted that this Rs. 2,255 crores programme is not resource-based as far as our own State resources are concerned. Only in 3 out of the 14 lines (Cement, Sugar and Fruits) are the proposals based on State resources. It is also not based on the capital resources raised in the State by the banks, UTI, LIC, etc. Apart from the external economies that flow from our flying start as a State in industrialisation, this Plan for the expansion of large, medium and small industries (I have not referred to the small industries plan here) will depend on two factors; first the State offering an attractive industrial climate and ensuring industrial peace and second its being able to offer an effective management and innovation prospect, based on a first class and fast moving R&D programme. Here is a double task. First for the State to establish machinery at the State level (The Tamil Nadu Science Foundation proposed by the State Planning Commission) to develop the R&D priorities for this large programme. For Tamil Nadu this is a matter of industrial survival and progress. The second is for the National projects in industrial R&D to be based on these state priorities.

Or take the area of power in Tamil Nadu. Our daily power requirement in the State to-day (before the 75 per cent cut) is around 23 million units. With the Fifth Plan projected industrial growth rate of 9.2 per cent against the Fourth Plan average of 5 per cent and the completion of the rural electrification programme and the energisation of agricultural pumpsets, our power needs will increase from 1,720 MW this year to 3,360 MW by the end of the Fifth Plan, and even so our per capita consumption will be less than 300 KW hours. Our first need is for more than doubling of our generating capacity. A second problem is to establish a better balance between the three energy sources—

hydel, thermal and nuclear—against our current two-thirds reliance on hydel sources and to economise on the fuel used. A third problem that we face is to reduce our transmission losses which are some where between 18 and 20 per cent, placing this State and seven others well above the other States' average of 12 percent. Our R & D power needs are the proper technical functioning of our thermal and hydel stations and the State Electricity Board, reducing our trans-mission losses through bringing loads closer together and reducing the cost in the use of high voltage under-ground cables, and switching from AC to DC, and full use of existing 110 MW generating sets, capacilty and production of high pressure boilers and turbines for use by our industries to generate and economise on their power even as the NCST blesses long-term research on 500 MW generatores and the Magneto—Hydrodynamics generator which will be of no help to us in meeting the Fifth or Sixth Plans power needs. (Given however the long gestation period of some R & D programmes such as these, a start on them should now be made without raising the early hopes done by the document). The National R & D Plan for power should be firmly based on States' priorities such as I have mentioned, which will then enable it to give the proper place for the various projects with short and long-term pay—offs. The National Plan again has the task of basing its sectoral programmes for the chemical, metallurgical engineering and other industries on a synthesis of these needs—at what I called the middle process of national planning for science and technology. And such spatial application and synthesis of needs and priorities are needed in all the thirteen areas referred to in the approach paper.

Use of Scientific and Technological Potential:

If R & D programmes and all their by-products are essential for the survival and continued expansion of Tamil Nadu's industry and agriculture and the attainment of the seven goals that the State has set forth for itself in its Perspective Plan, it is equally imperative that such R & D facilities as exist in the State should be fully used and new facilities created. Among the existing R & D facilities which are not being fully used and among those with potential are (a) the R & D programmes and Institutes of the Union and State Goverements ranging from CLRI, Madras, CECRI, Karaikudi, CSIR Complex, Madras, to the Highways Road Research Laboratory and irrigation ground water and many agricultural, veterinary and health State R&D institutes, (b) the slow small beginning and the potential represented by industry in the public and private sector in the State, such as SITRA, SISMA, BHEL programmes to which I will refer later; and (c) the engineering educational institutions, notably IIT Madras, the College of Engineering, Guindy, the Regional Engineering College, Tiruchy, and the Coimbatore Engineering College complexes. in all of which the fine distinction made by the approach paper, which is also the traditional UNESCO definition, between basic research, oriented basic research and applied research and development breaks down. IIT has been in the research front of anti-air pollution and electronics in the State and has helped produce the machines now in use; the Guindy Engineering College has been responsible for the research break throughs in effluent treatment and industrial waste disposal among many others; the Tiruchy Regional Engineering College research feeds the BHEL and its ancillary plants; the Coimbatore Engineering Colleges research is aimed in part at the complex problems in modernisation of textile mills. The Tamil Nadu Agricultural University has unlimited protential for agricultural and veterinary

research. There is a serious lag in Medical research. And then there are our Advanced Centres in the Universities—which are also too few and far between and Institutes like MATSCIENCE which can provide the essential basic research infrastructure on which all R & D efforts rest. I have a feeling that these three sources for developing and using in this State and other States their full scientific and technological potential are not taken into account in the approach. paper. I would suggest developing regional and State mechanisms such as we have proposed in our Science and Technology Plan for this State, together with the additional programmes to ensure the development and full use of our research resources in this vast region. Incidentally in regard to use of University institutions, I am in agreement with the recommendations that major R & D agencies farm out to the Universities relevant basic research. I am against the further recommendations for a central source of funds or a separate central machinery for this purpose. Because that would be creating more machinery and more bureaucracy which will eat up the funds. Why not use the existing machinery, the UGC and the National Academy of Science to channel funds and monitor programmes?

R&D and the Private Sector :

I have referred to the potential role of the private sector in the R&D programme. The approach document computes that private companies are spending only Rs. 14 crores on R & D, while the government expenditure is of the order of Rs. 214 crores, that is 6 per cent of the country's total expenditure and less than 0.06 per cent of their sales turn over. In fact in this matter both the private and public sector companies are guilty. With an annual production of Rs. 5,000 crores, their R & D expenditures are miserably low at less than Rs. 20 crores. The failure of the corporate sector is not only quantitative, but their small R & D expenditures are usually on inventory and quality controls and testing and such like routine operations, as the approach paper points out. There are however multiple problems here. First it is always easy to import the technologies required and against the general international commercial practices and the compulsions of the multinational corporations, our business firms are importing technologies at the rate of 5 imports per week. Second is the absence of motivation flowing from what the approach paper calls the regulatory practices of Government which do not ensure a Firm that the results of its R and D efforts will result in its production capacity being increased. Third is the small isolationist islands tradition that we have developed, resulting in a complete absence of linkages between such R & D institutions that we have and the public and private sector firms. And finally there is the question of resources and costs. So many even of what we call our greater industrial houses are in international corporate terms small or medium size units in the West or Japan and cannot afford the R & D charges and the even greater innovation costs. I am not here proposing some kind of technological autarchy, a closed self sufficient technology. That would be a contradiction in terms. I recall a couple of months ago the German Ambassador telling us that in his country if Mercedes Benz or Seimens advertised their products as being developed entirely by German technology, no one in his country would buy their cars. What I am suggesting is the accepted UNESCO doctrine that development is endogenous and its motor force which is science and technology cannot be borrowed from outside or grafted on externally. It must be part of

the national economic system. This means that every Firm which imports technology should first assure itself that is not a repetitious import, that it is not available in the country, and that it has all the minimum R & D capability to use and adapt it and make it its own, following the pinching technology pattern which the Japanese use when importing foreign technology. Second each Firm, starting with public sector Firms and larger industrial houses, should set up R & D units to effect constant and continous technical improvements in its current and future products. Finally we need a network or system of linkages between Firms and R & D institutions, together with a Central Data Bank on imported and Indian processed technologies to begin to develop our own minimum technological infrastructure. Against these imperatives, the small R & D start in this State made by public sector firms like the Boiler Plant in Tiruchi and private sector firms like Seshasayee, Mettur Chemicals, Madras Rubber Factory, EID Parry, SIMCO, Aluminium Industries, the Easun Group need to be extended, rationalised and strengthened. To make a start our major corporate firms in the State must employ scientific and technological researchers within their innovation programmes. The past and current imbalances in this regard must be righted. In 1958-59, of 18,000 research scientists and engineers engaged in R & D, only 200 were employed in the private sector. In 1968-69, out of 62,349 such researchers in the Country's R & D, a mere 2,333 were employed by the private sector, according to the Report of the Cabinet Secretariat Committee on Science and Technology issued in 1969. In the electrical equipment and communication industries, the international norm is that 8.5 percent of net sales of a producing unit should be spent on R & D, while our large electricals do not average 0.1 per cent; in ferrous metals the international norm is 0.7 per cent, while our largest private producer averages 0.25 per cent. Here I should point out that in science-based industries like these, the international norm is also the Indian norm. It is like the Boeing 707 requiring the same quantity of aviation gasoline per 100 air KMs whether it flies over India or Europe. A start should therefore be made in the corporate sector by employing research scientists and engineers in some relation to their annual out-turn. Should there be some govermental regulation or prodding in this regard? Mr. Subramaniam has recently announced that Government proposes to stipulate a rider that importers of technology will be required to set up the necessary R & D structures in their establishment. The recent Conference of the Engineering Association of India (Western Region) has however come out strongly against what it calls statutory imposition of Government controls and regulations in the field of R & D because it claims that this would lead to stifling of industrial and organisational enterprise and initiative. But we are not faced with an either or situation. It is not total Govermental regulation which will stifle R & D or complete freedom which has encouraged enterprise initiative merely in importing foreign technology on every possible occasion that is needed. It is I believe for the Committee, chaired by the Director-General of CSIR, to work closely with the corporate sector in order to propose agreed incentives and some regulation for the promotion of R & D in the corporate, and particularly the private corporate, sector.

Costs of Research:

The approach paper states that the cost of its National Plan can be computed only after the draft programmes have been worked out in detail, on the basis of

priority needs indicated rather than on just absorptive capacity. Meanwhile it recomments (a) the levy of an R & D cess on a graded basis on all industrial units in both the public and private sector which will raise around Rs. 300 crores during the Fifth Plan period and b) the allocation of 1 per cent of G.N.P. for R & D by the end year of the Fifth Plan (which will be Rs. 2,000 crores) in accordance of the recommendations of UNESCO's CASTASIA and ECOSOC's ACAST and the United Nations Development Strategy for the seventies. These are sound recommendations and we must work for their acceptance. The proposed R & D cess seems to be gathering opposition. The Western Region Conference of the Engineering Association of India, which I earlier referred to, flatly opposes the cess on grounds (i) the common dislike of all taxation, (ii) the money being wastefully employed, (iii) the industries having no say in its disposal and (iv) its slackening effects on voluntary research and fresh initiatives by the firms. I take these points as useful warnings for ensuring that the Rs. 300 crores are used for effective priority R & D programmes that will be determined in consultation with industry. In fact if the network and system of linkages is established between the scientific community, R & D establishments and the corporate sector, these fears should not materialise. The costs of R & D are high and they are made higher because the R&D chain consisting of the research invention going on the five links of engineering design, tooling and manufacturing, tests, start of manufacturing and start of marketing is disrupted and discontinuous in our Country. I am here not only referring to the familiar and yawning gap between our research activities and findings and their production outcome, so that many of us would like to see a little less spent on research (oriented or applied) and a *little more on the industrial application* of our research findings. Research in the R & D chain has only a one direction flow—and that is innovation. And innovation is about ten times as costly as the invention part of research. In the whole process of production innovation, the research cost is around 5 to 10 per cent, while the innovation part is 90 to 95 per cent. This means that even as we provide for the R & D cess, and 1 per cent of our GNP for financing research-industry, primary and secondary, and the other areas of health, housing etc., we must provide the much larger resources needed to transform the research results into actual production flow. For this, as the Engineering Association Conference reminds us, there must be a mixing of the R & D departments and personnel with those engaged in production, cost-accounting and marketing which will make R&D fructify and will also ensure that it is governed by modernised management.

Scope of Research :

It is at this point that I wish to call attention to the multi-disciplinary, in fact trans-disciplinary character of our R & D needs and programmes as outlined in the approach paper, which however does not give expression to this imperative except in one area. It is only in regard to the R & D effort needed by our massive family planning programme that the document speaks of the "urgent need to enhance the R&D effort in this area not only in regard to the natural sciences but also in the social and behavioural sciences". Even in this reference and throughout the document there is a dichotomy maintained as between research in the natural sciences area and that in the social sciences area. But the problems faced by the country demand the techniques and know-how of natural and social science in every case. Whether it be the application of the new

agricultural technology by our farming community, the change of animal husbandry and fishery practices, the market effects of man-made fibres right on to space technology uses, social science research techniques and the know-how of economics, psychology, sociology, and political science—have to be used as much as those of physics, chemistry, engineering and biology. I therefore suggest that (i) in the further elaboration of the programmes their inter-disciplinary and trans-disciplinary nature be borne in mind and specifically provided for, (ii) applied social science research for these priority programmes be financed out of the 1 per cent GNP and R&D cess referred to earlier and (iii) the interaction of the natural and social sciences be promoted by the professional bodies involved.

I began by saying that this approach to the Science and Technology Plan represents for scientists and the Country a cross-roads. The document lights up that future path, that we must traverse, with clarity and cogency. It calls for us in the State to do the necessary homework on our R & D priorities, which can mesh in with macro-programmes being developed; to develop our R & D institutional capabilities on which our agricultural and industrial march forward and the raising of the bottom 3 deciles of our people in the State who live in poverty depend; to help and invite our corporate sector to set up their R & D units with the necessary incentives to be provided by Government and to forge the links between the scientific community, the R&D institutions and our multitudinous users of R & D in the State, so that we can develop our own technology and use most effectively that which we must import; to support the important financing proposals for these programmes and ensure that the production-flows that they will lead to are also financially underwritten; to integrate our total scientific resources—those of the natural, engineering, agricultural, medical and social sciences in the battle for progress and equity that will be joined in the Fifth Plan. I believe that we will respond to this challenge. Let us start our response now

CORRESPONDENCE

Note presented by Thiru C. S. Mahadevan, Secretary, Task force on Large Industries on the points raised by Prof. S. Sampath in his article on Large and Medium Industries in Vol. III page 274 to 293.

It is not as if the Task Force on Large scale Industries has recommended the promotion of capital intensive industries to the exclusion of Small Scale Industries. All that it has in mind was the fact that available financial resources should be made to yield the maximum benefit in terms of employment, production, value added by processing and so on. Actually, the capital intensive industries that have been recommended to be promoted will create large side-effects. For instance, the manufacturers of caustic soda will be consuming huge quantities of salt which requires heavy manual labour. The transport of these quantities will also provide additional employment. Again, the manufacture of polythene, polyvinyl chloride and other items will give scope for promoting numerous small industries for manufacturing polythene lined bags, plastic products, footwear, PVC tubes, etc. The automobile ancillary industries will also grow steadily in stature and the impressive expansion of these industries in the past few years has led to a remarkable proliferation of small scale units which are sub-contractors to the main industrial unit for supplying components and various other items. Besides, the Chairman of the Task Force on Large Scale Industries who is also the Chairman of the Task Force on Small Industries, has made suitable recommendations for the promotion of village and small industries with a view to providing local employment and developing also feeder industries for the large scale industries.

As regards the absence of any progression in investment in the industrial sector in the 5th and 6th Plan periods, they have been explained in the Task Force Report itself. The relatively large investment in the 5th Plan is due to the heavy expenditure that will be incurred on the Salem Steel Plant in the 5th Plan period. Out of a total of Rs. 450 crores on this project, it is assumed about Rs. 350 crores will be spent in the fifth plan alone. The fundamental position regarding the progression will be understood if the outlay on the Salem Steel Plant were excluded in both the Plan periods. On that basis, the investment in the 5th Plan will be Rs. 719 crores and in the 6th Plan Rs. 1,085 crores. This point has definitely been overlooked when making the comment.

It is also necessary to draw your attention to the fact that the Task Force has been all the time keenly aware of the difficulties that might be encountered in the implementation of the 5th Plan schemes if there were serious bottlenecks in regard to the availability of electricity, water and transport facilities. No attempt was made to have a midterm appraisal as the State Government has already attempted such an appraisal and it must be said to the credit of the Tamil Nadu Government that the Plan targets will be fulfilled in substantial measure in physical terms in many directions and the financial outlay also will be easily exceeded. There has of course been a slipping in schedules of implementation in some directions as in the case of Kalpakkam but by and large, agriculture, irrigation, industrial and power projects under the purview of the State Government will be completed on schedule. The difficulty now being experienced on the power front is due to the exceptional factors though it must be admitted that the growth in demand for electricity has far exceeded the earlier expectations and the Centre also has been under the impression that the regional approach to power problems was more important than the State's ...

THE THIRD CENSUS OF SOCIAL SCIENCE RESEARCH IN TAMIL NADU

The third census (1973) of Social Science Research in Tamil Nadu follows the second census reported in the Institute Bulletin Vol. II, No. 6, of June 1972.

The questionnaire issued in February 1973, was addressed to 5 Universities, including the Indian Institute of Technology, Madras, 17 Colleges, 4 Research Institutes, 8 Departments of the Government and 2 Institutes of Rural Higher Education in Tamil Nadu. Reports contain information about a total number of 270 projects in the different Social Science disciplines. The table below presents a comparative statement of the three yearly censuses of 1971, 1972 and 1973.

Discipline	*No. of research projects in*		
	1971	*1972*	*1973*
1. Economics	85	40	109
2. Agricultural Economics and cooperation			49
3. Econometrics	—	1	2
4. Education	—	5	2
5. Commerce	—	—	5
6. Criminology	—	1	2
7. Development	—	—	1
8. Engineering	—	—	1
9. Geography	—	—	1
10. History	8	8	4
11. Politics & Public administration	—	—	1
12. Mathematics & Statistics	—	—	11
13. Humanities	—	—	1
14. Mathematical Economics	—	—	2
15. Psychology	31	11	14
16. Social Work	—	5	7
17. Sociology	7	4	2
18. Home Science	44	36	—
19. Philosophy	—	1	—
20. Cultural Studies	—	1	—
21. Environmental Studies	—	2	—
22. Anthropology	3	—	—
23. Linguistics	—	—	56
	178	118	270

The areas of current research reported show Economics being well ahead of all other disciplines with 109 projects. A new addition to the disciplines this year is Linguistics with 56 reports. Unlike the last census, Agricultural Economics is shown under a separate heading with 49 items, with Psychology 14, Mathematics and Statistics 11, Social Work 7, Commerce 5 and History 4. Education, Criminology, Ecomometrics, Mathematical Economics and Sociology have 2 projects each and Development, Engineering, Geography, Humanities, and Politics one each. There is complete absence of reports on Anthropology and reports on Home Science research have not been received. Reports on research work prior to 1969 have not been included.

The Economics research projects leading to University degrees are mostly empirical studies and involved in primary data collection on the basis of random sampling and questionnaires. Analytical and theoretical work and basic research are very limited in quantitative census. Similarly in Agricultural Economics, the majority of items are involved in data collection with too little of the application of the principles of Economics to the two phases of agricultural enterprise namely Farm Management and Marketing. One suggestion that could be made in this regard is that research work by one Institute or College could be coordinated to cover all aspects of the agricultural enterprise in one area instead of the varied studies in various areas. The research in Psychology covers a variety of subjects. The projects in Mathematics and Statistics are mainly on aspects of the Probability Theory. Further development in the process of application of mathematics and statistics for research in Social Sciences would be of advantage to research work. The studies in Linguistics cover many aspects of the four South Indian languages, Tamil, Telugu, Malayalam and Kannada.

The picture of social science research as seen from the reports shows that a wide range of research is being undertaken by the Universities, their constituent colleges and research institutes. But the picture is still incomplete as a number of institutions have not reported. Studies on industrial enterprises of the state are few. The most important aspect that has yet to be developed is the need to co-ordinate academic research to the requirements of the state and society for development on the accepted basis of the Fifth Five Year Plan. In this regard the follow up by the research institutions of the conclusions and recommendations of the 1971 seminar on consumer/user oriented research (See Vol. I. No. 9 Pages 25—40) is still lagging and should be further pursued under the auspices of the State Planning Commission.

I. ECONOMICS

Annamalai University—Dept. of Economics

1. Capital formation in agricultural sector in Thanjavur District

Reported in the **Bulletin** Vol. II, No. 6, **Page** 71.

2. Life Insurance growth since nationalisation

Reported in Vol. II, No. 6, Page 72.

3. A Study of fluctuations in land values in Chidambaram taluk

Reported in Vol. II, No. 6, Page 72.

4. Economics of Urbanisation in Tamil Nadu and allied problems—to analyse the problems of urbanisation in Tamil Nadu and the socio-economic and socio-cultural transformations that follow urbanisation

Method of Study to be framed.

Commencement — 11-10-72
Completion —
Degree — Ph. D.

5. Disguised unemployment in Tamil Nadu.

Dividing Tamil Nadu into four Cultivation areas namely paddy, sugarcane, Cotton and groundnut and taking three typical villages from each area to quantify the extent of disguised unemployment by employing a manpower budgetting approach or micro non-aggregated farm management data.

Commencement — 3-10-72
Completion — 2-10-73

Sponsored by the Finance Dept. of the Govt. of Tamil Nadu as a scheme for the award of research fellowship to post—graduates in Economics.

6. Panchayat finances in Tamil Nadu
Reported in Vol. II, No. 6, Page 72.

7. The impact of Panchayat Raj on Community Development, to evaluate the impact of panchayat development on the progress of Community projects.

Evaluation drawn up on the basis of replies to Questionnaire to Panchayat Unions.

Commencement — 10-10-70
Completion — 1-12-72
Sponsored by U.G.C.

Loyola College — Dept. of Economics

8. Study of Unemployment in Madras City.

To assess, as far as possible, the extent of unemployment in Madras City in relation to City's total labour force, and find out causes of unemployment and certain qualitative aspects of employment and unemployment, by simple random sampling. Interview Schedule used.

Commencement — 15-3-72
Completion — 15-9-72

Sponsored by the Dept. of Economics

Fatima College, Madurai — Economics
Department

9. Industrial Entrepreneurship in Madurai district with reference to Small Scale Industries.

To investigate the backgrounds of entrepreneurs, the growth of Small Scale industries and problems. Personal interviews were held with the entrepreneurs.

Commencement — Oct. 1967
Completion — Oct. 1969
Degree — M. Litt.

National College, Tiruchy — Post—graduate Dept. of Economics

10. The role of public expenditure in Indian development under planning.

Commencement — Oct. 1969.
Completion — Jan. 1973.
Degree — M. Litt.

11. Impact of ceiling on agricultural holdings in Tamil Nadu, from 1950 to 1972.

A random sampling survey of districts of Tamil Nadu such as Tiruchirapalli Tanjore and South Arcot for obtaining useful data to give a graphical illustration about the impact of agricultural ceiling in Tamil Nadu.

Commencement — 1-10-7?.
Completion — 1-10-75.
Degree — Ph. D.

12. *Impact of nationalisation of Banks* on agricultural growth in Tiruchirapalli district. The impact measured by area, value of products, productivity, fertilisers used, net income etc.

The analysis *and/or methodology* will include a special *ad hoc* survey in chosen tracts of the District, besides perusal of Connected documents lying with the Nationalised Banks concerned. Two types *of Questionnaires/Schedules* to be used.

Commencement — 1-3-73.
Completion — 1-3-76.
Degree — M. Litt.

Gandhigram Rural Institute, Gandhigram

13. Entrepreneurship in small-scale Industries in Madurai City and its environs. To identify the characteristics of entrepreneurs, factors that influence entrepreneurship and the economic structure.

Pretested Schedules to meet the objectives were used. Factor analysis would be employed in finding out the effectiveness of *influence* of *socio-demographic*, economic, pyschological etc. factors in entrepreneurship.

Commencement — 1-1-72.
Completion — 1-6-73.

Sponsored by the ICSSR, New Delhi.

14. Agricultural *development in* Tamil Nadu and its effect on small farmers with reference to technology, income distribution and *marketable* surplus.

Study is on selected food and commercial crops in two districts. Official and *non-official reports to* be used and field study *using* pre-tisted schedules.

Commencement — Jan. 1973.
Completion — *June* 1976.
Degree — Ph. D.

Presidency College, Madras —
Economics Dept.

15. Lerner-Lange. Model—application for Indian Public Undertakings. To decide a price out policy for Public Undertakings—Cost benefit performance. Cost-benefit approach.

Commencement — *1972*
Completion — —
Degree — —

16. An empirical enquiry into production functions and *technical changes* in the Indian manufacturing industries. An econometric study using the Cobb-Douglas and Constant Elasticity of Substitution production functions.

Commencement — Dec. 1972.
Completion — June 1973.
Degree — —

Madras University — Post—Graduate Centre, Tiruchi

17. Industrialisation of Tamil Nadu since 1951—a structural analysis.

To analyse the *structural changes in* the industrial sectors and the Correlation between the Capital Structure and the industrial Structure. An empirical analysis.

Commencement — 7-2-70.
Completion — 7-2-72.
Degree — M. Litt.

18. Social aspects of economic development.

To study the effects of the two major social institutions viz: family and caste on economic development. Interview and Survey Study.

Commencement — Sept. '69.
Completion — Sept. '71.
Degree — M. Litt.

19. Investment Priorities.

An analysis of the order of investment so that the direction of investment planning may be ordered. Theoretical.

Commencement — March '69.
Completion — *In progress*
Degree — —

P. S. G. Arts College, Coimbatore.

20. Fiscal Structure of the Coimbatore Municipal Council.

This is a micro level study of the municipalities in Tamil Nadu—Revenue resources, sufficiency thereof, non-utilization and under utilization of taxing powers and incidence of taxation per head of population, revision required etc.

Collection of secondary data and preparation of questionnaire to be done.

Commencement — April '71.
Completion — —
Sponsored by U. G. C.

21. *Survey of Engineering Industries* in Coimbatore.

To analyse the importance of engineering units producing power driven pumps and electric motors. Study by random sampling of about 20 per cent of the total population. Collection of data through investigators by questionnaire.

Commencement — June '72.
Completion — June '74.
Sponsored by U. G. C.

Madras Christian College, Tambaram —
Dept. of Economics

22. Transfer of technology in Indian agriculture.

To study the nature of technological progress and impact of transferred technology toward the optimum solution. Field study covering three distinct regions of high, medium and low levels of technology and holdings of different patterns with the application of linear programming, factor analysis, regression and vintage model approach.

Commencement — March '72.
Completion — March '75.
Degree — Ph. D.

23. Entrepreneurship in Tamil Nadu.

To identify the factors which influence the supply, and success of entrepreneurship, and indicating their role in development of entrepreneurship in Tamil Nadu, utilizing secondary data and making a depth study of a few selected business houses.

Commencement — March '72.
Completion — March '76.
Degree — Ph. D.

24. A disaggregated study of Productivity in Indian industries.

To study the changes in labour productivity in Indian large scale industries since independence and the source for, low or high technical change in Indian industries.

Commencement — Jan '71.
Completion — Jan. '74.
Degree — Ph. D.

Sri Meenakshi College, Madurai — Dept. of Economics

25. The consumption pattern of handloom clothes among a section of College educated ladies of Madurai.

Questionnaire method was used to interview 1000 ladies.

Commencement — 1969.
Completion — 1970.

Sponsored by the Planning Forum of the College.

26. An opinion survey on clubbing of incomes of husband, wife and minor children.

Questionnaire method adopted to interview about 4000 women working in offices.

Commencement — 1972.
Completion —Feb. 1973.

Sponsored by the Planning Forum of the College.

27. A socio-economic survey of Mudakkathan-Alangulam villages, Madurai.

Questionnaire method was used to survey all the 153 households of the villages.

Commencement — 1970.
Completion — 1970.

Sponsored by the Planning Forum of the College.

Madurai University — Economics Dept.

28. Printing industry in Sivakasi.

To study the growth trends of some of the printing units through labour productivity, Capital productivity, Capital-output ratio, marginal Capital-labour ratio and respective growth ratio through end point method.

Sampling Method adopted.

Commencement — 11-12-72.
Completion — 3-1-73.
Commencement — M. Litt.

29. Foreign trade of Tamil Nadu.
To study the exports and imports of Tamil Nadu, their trend, direction and Composition—Historical and analytical.

Commencement — 3-1-73.
Completion — 1975.
Degree — M. Litt.

Institute of Techno — Economic Studies Madras.

30. Techno-Economic Survey of Ramanathapuram.

Reported in the Bulletin Vol. II, No. 6, Page 73.

31. Structure of Cigarette Industry in India.

Reported in the Bulletin Vol. II, No. 6, Page 74.

32. Viability of Dairy farming in Selected Centres of Tamil Nadu, Kerala and Mysore.

Reported in the Bulletin Vol. II, No. 6, Page 73.

33. Study on the raw material position for a toddy bottling plant in Tuticorin taluk—extended to Tiruchendur taluk.

The object is to estimate the number of palmyrah trees in Tuticorin taluk, to study the tapping season and assess the tapping labour position.

The survey team collected information by discussions with taluk officials and the

District Cooperative Palm Gur association and also directly.

Commencement — July '72.
Completion — Aug. '72.
Sponsored by a private firm.

34. Incidence of taxation in Tamil Nadu.

Reported in the Bulletin Vol. II, No. 6, Page 74.

35. Medical Manpower requirements for the State of Tamil Nadu.

Reported in the Bulletin Vol. II, No. 6, Page 74.

36. Evaluation of Bhoodan Land Utilisation Programme in Tamil Nadu.

The study aims at evaluation of fulfilment of the objects of Bhoodan movement and includes the quality of land donated, recipients, changes in size of land and the trends in social and economic change.

Six villages where Gramdhan or Bhoodan is functioning selected for study in consultation with the Bhoodan Yagna Board.

Commencement — Dec. '72.
Completion — In progress.
Sponsored by ICSSR.

37. Study to assess the magnitude of the problem and resources for the implementation of Governments' scheme of providing house sites to landless labour in rural areas—Tamil Nadu and Kerala.

Two districts each from Tamil Nadu and Kerala and three villages from each district selected for field investigation.

Commencement — Feb. '73.
Completion — In progress.
Sponsored by the National Buildings Organization, New Delhi.

Scott Christian College, Nagercoil — Post Graduate Dept. of Economics

38. Panchayat Raj and economic growth in Kanyakumari District.

Reported in the Bulletin Vol. II, No. 6, Page 69.

39. Agricultural Co-operative Banking —a case study of the Kanyakumari District, Co-operative Central Bank.

To study the working of the Central Co-operative Bank and to assess its success in dealing with the problems of agricultural credit.

Statistical study and sample survey used.

Commencement — July '72.
Completion — July '75.
Degree — M. Litt.

Madras Institute of Development Studies.

40. Land reform in Tamil Nadu.

Reported in the Bulletin Vol. II, No. 6, Page 72. (Completed)

41. A State-wide programme of low priced supply of rice, cloth and Kerosene for the urban and rural poor.

Reported in the Bulletin Vol. II, No. 6, Page 73. (Completed)

42. Rural Employment in Tami Nadu— (Completed)

43. Minor irrigation and productivity in Tamil Nadu.

A study of the Cost-benefit analysis of the minor irrigation projects and their viability effect on productivity in agri-

culture ; based on secondary data and other reports.

Commencement — Feb. '73.
Completion — July '73.
Sponsored by the Institute.

University of Madras—Economics Dept.

44. Economic and legal aspects of land reforms. (Legal Economics)

A Comparison of the implementation of land reforms in selected districts and whether the reforms lead to greater productivity to be examined.

Consists of field studies of selected districts and also interviews with those connected with land legislation.

Commencement — March '71.
Completion — '74.
Degree — Ph. D.

45. State Bank of India—a study of its developmental activities since 1959. (Monetary Economics).

Historical and analytical method.

Commencement — Jan. '72.
Completion — Jan. '74
Degree — M. Litt.

46. Public Debt (Fiscal Economics).
To examine the economic implications of Public Debt on developing economies, with special reference to India.

Commencement — April '73.
Completion — 30-4-75.
Degree — M. Litt.

47. Studies in Economic Ideas of selected leaders in Southern India, 1919–1970. (Indian Economic Thought).

Field study would include interviews with outstanding leaders.

Commencement — 12-2-73.
Completion — March '75.
Degree — M. Litt.

48. Some issues in Federal economic relations (Fiscal Economics)

To study the various aspects of Federalism and its financial implications with special reference to India.

Analytical study of Federal Constitutions and their financial relations.

Commencement — 1-9-71.
Completion — 31-12-75.
Degree — Ph. D.

49. Population growth and economic development — an analysis of Indian experience since 1950. (Development Economics).

To analyse the economic implications of population change in India since 1950 and to examine the impact of population on economic development in the light of the objectives of the plans.

Commencement — 1-12-69.
Completion — 31-7-73.
Degree — M. Litt.

50. Taxation and industrial development (Fiscal Economics).

To study whether tax policies have any relevance for industrial development. Analytical study, including brief case studies of sugar and cement.

Commencement — 1-4-70.
Completion — 31-3-72.
Degree — M.Litt.

51. Co-operative Printing Industry (Indian Economic Development).

To study the economics of the Co-operative Printing Industry and problems facing it.

Survey of the concerned Co-operative printing presses.

Commencement — 22-9-71.
Completion — 31-12-73.
Degree — M. Litt.

52. Regional variations and economic development with special reference to Tamil Nadu, since the commencement of planning. (Regional Economics).

To analyse how far regional development, helps Indian Economic Development, particularly in the light of industry and cost of living.

An analytical study.

Commencement — 31-4-71.
Completion — 31-3-73.
Degree — M. Litt.

53. Union-State Debtor-Creditor relationship and its implications.

To study the nature of Union and State Debt relationship and its implications.

Commencement — 31-1-71.
Completion — 30-1-74.
Degree — M. Litt.

Sponsored by Finance Dept., Govt. of Tamil Nadu.

54. Economics and social change with reference to the Co-operative movement in India.

To study the economic productivity and social betterment as a result of the Co-operative movement in India.

Field study and study of the Co-operative organisations in North Arcot district.

Commencement — 1973.
Completion — 1974.
Degree — Ph. D.

Sponsored by the Indo-Swedish Reciprocal Scholarship Exchange Programme.

55. Economic and social Consequences of the introduction of HYVs of rice in India. (Socio-Economics).

Field studies of South Arcot District.

Commencement — Jan. '72.
Completion — 1974.
Degree — Ph. D.

The following are all completed projects.

56. Federal Economic Relations (Fiscal Economics).

Degree — Ph.D.

57. Centre-State financial relations in India (Fiscal Economics).

58. Wanchoo *et al* on Direct Taxation (Fiscal Economics).

59. Madras Mint (Monetary Economics).

Degree — M. Litt.

60. Industrial Development Bank of India (Monetary Economics).

61. Monetization in ex-Colonial economy (Monetary Economics).

Degree — Ph. D.

62. Economics of Money and Banking (Monetary Economics).

Degree — M. Litt.

63. Study of Loans advanced by Land Development Banks (Monetary Economics).

64. Central Banking in India—A study of recent developments (Monetary Economics).

65. Bank Charges in India (Monetary Economics).

66. Medium term co-operative finance in Madras State (Monetary Economics).

67. Rural Credit Societies and the Nationalised Banks (Monetary Economics).

68. Some Overseas British Banks (Monetary Economics).

69. Some dilemmas in co-operative development (Monetary Economics).

70. The Euro Dollar Business (Monetary Economics).

71. The role of Merchant Banking (Monetary Economics).

72. Income, Savings and Investment (Monetary Economics).

73. Economic Federalism in India (Regional Economics).

Degree — M. Litt.

74. Piggery Development in Andhra (Regional Economics).

75. Co-operative Credit Societies in West (Regional Economics).

76. Study of Economics of Farm Management in Thanjavur District, 1969-70. (Regional Economics).

77. The outlook for the economy of Tamil Nadu (Regional Economics).

78. Agricultural Development of Tanzania (Regional Economics).

79. Outlook for Pondicherry—an *entrepot* State. (Regional Economics).

80. Entrepreneurship in Tamil Nadu (Regional Economics).

81. Education and Economic Development with special reference to South India (Development Economics).

82. Role of District Administration in Indian Economic Development (Development Economics).

Degree — M. Litt.

83. Cultural Influences on Economic Development. (Development Economics).

84. Co-operation and Economic Growth in the Southern Region (Development Economics).

85. Trends in the economic development of Tamil Nadu.

86. Rent control legislation and its impact on production of houses in Tamil Nadu (Legal Economics).

87. Legal and economic aspects of land legislation (Legal Economics).

Degree — Ph. D.

88. Housing and building activity in the Southern region with special reference to the working of the Rent Control Acts in Urban areas (Legal Economics).

89. The city of Madras and its environs as Economic Growth Centres for India (Urban Economics).

90. Industrial Development of Madras with special reference to Labour (Industrial Economics).

91. A study on economics of mechanisation of fishing industry in Kerala (Industrial Economics).

92. Industrial Policy in developing countries with special reference to the role of financial institutions.

93. Review of wage patterns in industry (Industrial Economics).

94. Industrial development of Coimbatore district (Industrial Economics).

95. Some basic issues of research in Industrial Economics (Industrial Economics).

96. Communication Industry (Industrial Economics).

97. Industrial complexes (Industrial Economics).

98. Small Scale Industrial Units and their credit problems (Industrial Economics).

99. Capital and Production cost in Fertilizer Industry (Industrial Economics).

100. Economics of Printing Industry (Industrial Economics).

101. The concept of National Income with special reference to underdeveloped countries (National Income).

Degree — M. Litt.

102. A critique on 'Approach to the IV Plan' (Economics of Planning).

103. Rehabilitation of refugees from Mozambique with reference to Tanzanian planning (Economics of planning).

104. Formation of Working Groups for Planning (Economics of Planning).

105. A Review of Social Sciences Research in South Indian Universities (Economics of planning).

106. Problems of Small Farmers and Agricultural Labour.

107. A Project for resettlement of landless labour (Labour Economics).

108. Optimisation of Employment (Labour Economics).

109. Britain's entry into the EEC (International Economics).

II. AGRICULTURAL ECONOMICS AND CO-OPERATION.

College of Rural Higher Education Coimbatore

110. A study of the role of a Co-operative Marketing Society in the marketing of principal crops in Sankari Block, Salem district, Tamil Nadu.

To study the general pattern of marketing of principal crops, problems and difficulties, the role of selected societies and ways and means of improving their role.

Survey method was used.

Commencement — May 1972.
Completion — March 1973.
Degree — In partial fulfilment of diploma, M.Cop.

111. A study of the Mettupalayam Co-operative Marketing Society, in marketing Arecanut and other crops.
This study is on similar model as above.

Commencement — March '72
Completion — March '73
Degree — In partial fulfilment of diploma, M Cop.

112. An enquiry into the securing and utilisation of long-term credit provided by a taluk level Land Development Bank.

To study the procedure in granting loans, to assess its adequacy, the factors influencing time taken to obtain the loan and the purpose and utilisation. Survey method was used.

Commencement — July '72
Completion — March '73
Degree — In partial fulfilment of diploma, M.Cop.

113. An enquiry into the securing and utilisation of long-term credit issued by a block level Primary Land Development Bank.

This study is on similar lines as item above.

Commencent — Nov. '72
Completion — March '73
Degree — In partial fulfilment of diploma, M.Cop.

114. A Study of the operational efficiency of the Mahalinga Industrial Co-operative Tea Factory.

To study the soundness of the Capital structure of the factory, the efficiency in purchase of green leaves, production and marketing and members' satisfaction with the services provided. Case study method was used.

Commencement— Nov. '72
Completion — March '73.
Degree — In partial fulfilment of diploma, M.Cop.

115. A study of the operational efficiency of Theni Co-operative sale society.

To study the operational efficiency with reference to purchase, procurement, processing, marketing, linking of credit with marketing and benefits to members.

Case study method was used.

Commencement — Nov. '72
Completion — March '73
Degree — In partial fulfilment of diploma, M.Cop.

116. A study of relationship between members; individual and group characteristics and their participation in business and democratic control in Agricultural Co-operative Multipurpose Credit Societies.

Commencement — Nov. '72
Completion — March '73
Degree — In partial fulfilment of diploma, M.Cop.

Tamil Nadu Agricultural University, Coimbatore

117. Impact of institutional finance for agricultural development in Tamil Nadu.

To evaluate the pattern of utilisation of credit, to discern the class-wise distribution of beneficiaries, and to identify the problems of institutional agencies in providing agricultural credit.

Commencement — 1970
Completion — 1971
Degree — —

118. Pilot scheme for investigating the feasibility of introduction of crop insurance for major millets and paddy in Tamil Nadu.

Udumalpet, Dharapuram and Kangayam blocks for dry tracts for Cholam and

Cumbu. Thalavadu for dry ragi crop and Bhavani for paddy were selected.

Commencement — 1971
Completion — 1972
Degree — —

119. Changes in the pattern of labour utilisation, wage structure and labour productivity.

To study the extent of availability of agricultural labour in relation to demand to analyse, the fluctuations in wages, to estimate the family, permanent and casual labour, labour productivity and evaluate relationship between productivity and wages.

Commencement — 1971
Completion — 1972
Degree — —

120. Impact of Bank nationalisation on Co-operative credit in Coimbatore taluk.

To find out the changes in volume of credit advanced by Co-operatives after Bank Nationalisation, to identify preference of farmers and reasons thereof and to estimate the extent of credit distribution by the two agencies.

Commencement — April '71
Completion — March '72
Degree — —

121. Studies on the Economics of production of Chrysanthemum and Jasmine flowers in Periyanaickenpalayam and Sarkar Samakulam Blocks, Coimbatore District.

To compute the cost of production per acre and per unit and the resource efficiency in the production of Chrysantmum and Jasmine.

Commencement — 1969
Completion — 1970
Degree — M.Sc. (Ag.)

122 Economic analysis of production and marketing of potato in Ootacamund taluk of Nilgiris district.

To estimate unit cost of production to evaluate the resource use, to study the marketing and analyse price varition of potato.

Commencement — 1969
Completion — 1970
Degree — M.Sc. (Ag).

123. Optimum allocation of resources in selected farms of Chandragiri District, Andhra Pradesh—A Linear Programming approach.

Commencement — 1970
Completion — 1971
Degree — M.Sc. (Ag).

124. An economic analysis of multiple cropping in wet lands of Mannargudi Block, Thanjavur District.

Identifying the resource levels and possibilities of multiple cropping, analysing the resource limitations and formulating an optimum crop plan—Linear programming techniques.

Commencement — 1969
Completion — 1970
Degree — M.Sc. (Ag).

125. Investigations on the agriculturists' response with reference to regulated markets and their benefits in different regions of Tamil Nadu.

Two districts, North Arcot and Tiruchirapalli were selected and by random selection Arni and Jayakondan were chosen taking five villages from each.

Commencement — 1969
Completion — 1970
Degree — —

126. Economics of dry-farming in Kalyandurg Block of Ananthapur District, Andhra Pradesh.

To identify resource levels and bottle necks and to study the pattern of resource and suggest measures for improvement.

Commencement — 1970
Completion — 1971
Degree — M.Sc. (Ag).

127. Impact of improved technology on production and productivity in Emani Panchayat Samithi, Guntur District, Andhra Pradesh.

To formulate optimum crop plans, study the impact of improved technology, to estimate the marginal value product of factor inputs and determine the Size of family farms—Five villages were randomly selected.

Commencement — 1970
Completion — 1971
Degree — M.Sc. (Ag).

128. A study of management factor in the selected rice farms in Kovur Block of Nellore District, Andhra Pradesh.

By random sampling method 10 villages were selected.

Commencement — 1970
Completion — 1971
Degree — M.Sc. (Ag).

129. A comparative study of Tractor and Non-tractor farms in Coimbatore Taluk—an economic appraisal.

Coimbatore taluk was the universe—45 tractor owning farms and 45 farms not having tractors but about the same size were selected at random.

Commencement — 1970
Completion — 1971
Degree — M.Sc. (Ag).

130. A study on investment on filter point tube wells in Mayuram Block of Thanjavur District—an economic appraisal.

Out of 44 villages having filterpoints in Mayuram block, 6 were selected at random; Linear Programming techniques were used for analysis.

Commencement — 1971
Completion — 1972
Degree — M.Sc. (Ag).

131. Impact of new technology on income levels and pattern of income distribution among farmers.

Palani Block of Madurai District was selected and out of the 39 villages five were selected at random. To study disparity in income distribution conventional analysis of variance methods was used.

Commencement — 1971
Completion — 1972
Degree — M.Sc. (Ag.).

132. Pattern of investment and investment returns in agriculture in the Parambikulam Aliyar Project area of Coimbatore District.

Five villages were selected at random in Pollachi taluk. Conventional farm management analysis and functional analysis were used to draw conclusions.

Commencement — 1971
Completion — 1972
Degre — M.Sc. (Ag).

133. Economic analysis of production and marketing of coconut in Tiptur taluk of Tumkur District in Mysore State.

80 growers distributed by probability proportion among 10 villages were selected

by a three stage random sampling. Conventional method used in working out price spread.

Commencement — 1971
Completion — 1972
Degree — M.Sc. (Ag).

134. Economic analysis of production and marketing of potato in R.S. Pura tehsil of Jammu District in Jammu and Kashmir.

Multistage stratified random sampling method was used with the tehsil as universe. Price spread was studied by conventional methods.

Commencement — 1971
Completion — 1972
Degree — M.Sc. (Ag).

135. Production and marketing of apples in Handwara Block of Jammu and Kashmir.

A three stage stratified random sampling method with Handwara Block as the Universe was adopted.

Commencement — 1971.
Completion — 1972.
Degree — M.Sc. (Ag.)

136. A micro level study of factors influencing cropping pattern in Coimbatore district.

For the study three market Centres viz. Annur, Avanashi and Coimbatore were selected and 162 farms around these centres were covered.

Correlation studies, analysis of variance methods and regression method of analysis were used to draw the results.

Commencement — 1969.
Completion — 1971.
Degree — Ph. D.

137. Resource use study in Paddy farms of I.A.D.P. area in Vissakoderu Block of West Godavari District, Andhra Pradesh.

In Vissakoderu Block, out of 38 villages ten were selected by random sampling method.

Farm business analysis and functional analysis were used to draw the results.

Commencement — 1969.
Completion — 1971.
Degree — M.Sc. (Ag).

138. A study on market structure and supply response to prices of Chewing tobacco in selected taluks of Coimbatore district.

Two villages selected at random in each of Gobi, Palladum and Dharmapuram taluks. Multiple regression analysis was used to study the production response of farmers.

Commencement — 1970.
Completion — 1971.
Degree — M.Sc. (Ag).

139. Pattern of employment and wage structure of agricultural labour in Teni Block of Madurai District.

Three villages in Teni block were selected at random. Conventional analysis was employed to study variations in employment of labour and wage structure. A linear function was fitted to estimate labour requirement and wage structure.

Commencement — 1971.
Completion — 1972.
Degree — M.Sc. (Ag).

140. A study on capital requirements in farms of Gantyada Block of Vizianagaram taluk—Andhra Pradesh.

at of 105 villages, 10 were selected at lom. Simple analysis of variance and ession analysis were used.

Commencement — 1969.
Completion — 1970.
Degree — M.Sc. (Ag).

141. A study of problems of risk in nancing agricultural development — a nicro analysis in Annur Block of Coimbatore District.

4 out of 22 Panchayats in Annur Block were selected at random. Analysis of variance and discriminant function analysis were adopted.

Commencement — 1970.
Completion — 1971.
Degree — M.Sc. (Ag).

142. The magnitude and pattern of capital formation in deltaic area of Palayamkottai Block in Tirunelveli District.

Eighteen villages formed the universe and five villages were selected at random. Both conventional methods of farm business analysis and functional analysis were used.

Commencement — 1971.
Completion — 1972.
Degree — M.Sc. (Ag).

143. The economics of milk production in the integrated milk project area of Krishna District of Andhra Pradesh.

The sample consisted of 90 milk producers in 10 villages. Functional analysis was carried out by employing linear and Cobb-Douglass functions.

Commencement — 1971.
Completion — 1972.
Degree — M.Sc. (Ag).

National College, Tiruchy—Dept. of Economics

144. Import substitution in Indiar agriculture under Planning.

Commencement — 1-10-69.
Completion — 30-9-73.
Degree — Ph. D.

145. Diffusion of technology in Tamil Nadu agriculture.

Random sampling of selected villages in districts to study modern techniques in agro-industries—Comparing adopters and non-adopters.

Commencement — 1-1-69.
Completion — 1-1-74.
Degree — Ph. D.

146. Agrarian change and sociological implications.

To study the impact made on Society by the agrarian change taking place in India with special reference to North Arcot District.

Field surveys and interviews with selected farmers in North Arcot.

Commencement — 1971
Completion — 1972
Degree — M.Litt.,P.h D.

147. Agrarian change with reference marketing.

To examine the impact of agra change with special reference to marke in North Arcot District.

Field surveys and interviews important dealers in paddy in North District.

Commencement — 1972.
Completion — 1973.
Degree — M.Litt.,F

University of Madras—Dept. of Economics

The ensuing are all Completed Projects.

148. Socialism in the agricultural sector

149. A scheme of agricultural settlement and extension.

150. Rice cultivation in Tamil Nadu; strategy, achievements and constraints.

151. The Progress of High Yielding Varieties of Rice in Kharif and Rabi seasons.

152. Study of relative returns to Farmers from regulated and unregulated market for groundnut in Tamil Nadu.

153. Evaluation of simple fertilizer trails in Ramanathapuram District.

154. Financing of small farmers in Coimbatore District.

155. Land Reforms in Thanjavur District.

156. Agrarian Socialism and Co-operation.

157. Agricultural Development — A study of I.A.D.P.

158. Social Implications of Green Revolution in Tamil Nadu.

III. EDUCATION

Madras Institute of Development Studies

159. Education of the Scheduled Castes and Tribes in Tamilnadu.

Reported in the Bulletin Vol. II, No. 6, P. 75.

160. Rural primary education, wastage and adult literacy in Tamilnadu.

To study the present structure of primary education, wastage due to drop-outs and stagnation and extent of adult illiteracy and to suggest some reforms. Study based on secondary data and publications.

Commencement — July '72
Completion — July '73
Sponsored by the Institute.

IV. COMMERCE

Annamalai University, Chidambaram—
Dept. of Commerce

161. Consumers' co-operatives—with particular reference to Tamilnadu.

Field surveys and collection of data from societies directly.

Commencement — '70
Completion — Nov. '72
Degree — M.Litt.

162. Co-operative marketing with special reference to South Arcot District.

Field surveys and collection of data from the societies directly.

Commencement — '70
Completion — No. '72
Degree — M.Litt.

University of Madras—Dept. of Commerce

163. Marketing in Public Enterprises—A pilot study with reference to Hindustan Photo Films Ltd.

To verify the concepts of marketing management in public sector firms, to test the effectiveness of alternative methods of

data collection and to judge the feasibility of depth studies in the topics.

Proforma and schedules were used to collect data from the Sales Office and marketing fields.

Commencement – June '71
Completion — June '72
Sponsored by ICSSR

164. Warehouse location and transportation planning *and programming* in fertiliser sales.

To analyse the trading area for *a sample* fertiliser company based on its projected sales, to suggest optimum number and optimum location of warehouses and to recommend optimum transportation work on *the basis* of *relative freight* cost and depot cost, least cost was computed in a trading area.

Commencement — Oct. '72
Completion — March '73
Degree — —

165. Effect of size and store complexity on drawing power of super markets in Madras City.

Population statistics of the city and location of retail stores have been analysed, to indicate the drawing power of the main and mini super markets. Effective coverage of the super market verified by customer surveys and addresses.

Commencement — Jan. '72
Completion — Jan. '73
Sponsored by U. G. C.

V. CRIMINOLOGY

University of Madras — Psychology Dept.

166. Drug addiction among youth — process of drug addiction. Survey study and case history followed by discussion, and interview techniques.

Commencement — April '73
Completion — April '75
Degree — M.Litt.

167. Psychological and social aspects of murder and to study the personal factors.

Reported in the Bulletin Vol. II, No. 6, Page 81.

VI. *DEVELOPMENT*

Rural Development and Local Administration Department — Government of Tamil Nadu.

168. Pilot research project in growth **centres.**

The aim of the project is to evolve a methodology for perspective planning of the rural areas through the identification of growth and service centres and the related rural centres. The purpose is to evolve a methodology for the integrated area development through research undertaken.

Commencement — 1-10-'70.
Completion — End of Fourth Plan.

Sponsored by the Government of India, Dept. of Community Development and implemented by the Government of Tamil Nadu.

VII. ENGINEERING

Annamalai University-Dept. of Engineering

169. Hydrology.

The broad object of the study is to develop a method of analysis of the avai

lable hydrological data with a view to its intimate use in planning, design and operation of water resources projects.

On the basis of processes of stochastic hydrology it is proposed to obtain the relation between rainfall and runoff considering the magnitude, the sequence of occurrence and the probability of occurence simultaneously.

Commencement — 30-9-'70.
Completion — Dec. '74.
Degree — Ph. D.

VIII. GEOGRAPHY

Sri Meenakshi Government College, Madurai—Department of Geography.

170. Socio-economic survey of a village.

To study how social activities and environment are inter-related. Use of secondary data and questionnaire.

Commencement — Jan. '73.
Completion — March '73.
Degree — In partial fulfilment of the M.A. Degree.

IX. HISTORY

Presidency College, Madras—History Dept.

171. Feudalism in Ancient and mediaeval Tamil Country. Study of original sources, inscriptions and literary work.

Commencement — July '71
Completion — In progress
Degree — —

172. Untouchability in Tamil Nadu from the Sangam age to the Vijayanagar period.

By study and examination of Sangam classics and medieval Bhakthi literature and manuscripts.

Commencement — June '65
Completion — Dec '72
Degree — Ph. D.

Madurai University - Dept. of Ancient History

173. Corporate life in ancient Tamil Country to A.D. 1300.

To determine the structure and functions of corporate bodies of a public nature operating in Tamil Country relating to mercantile, religious etc. activities.

Material to be collected from contemporary sources. The study will be comparative.

Commencement — July '71.
Completion — July '74.
Degree — Ph. D.

174. Medieval Tamil Polity (A.D. 600—A.D. 1200).

To determine the governmental and social polities of the medieval Tamil.

Material to be collected from contemporary literary sources, original literature, inscriptions etc. The study will be comparative.

Commencement — Dec. '70
Completion — Nov. '73
Degree — Ph. D.

X. MATHEMATICS AND STATISTICS

Annamalai University—Mathematics and Statistics Dept.

175. Probability Theory and its applications.

Commencement — Oct. '72
Completion — Oct. '77
Degree — Ph. D.

176. Renewal Theory — Probability Theory and its applications.

Renewal Theory is an essential branch in Probability Theory, the research is to prove it for dependent—random variables.

Commencement — 2-7-69
Completion — '73
Degree — Ph. D.

177. Branching Processes—Probability Theory and its applications.

The objective of the research programme is to study the asymptotic behaviour of a total number of particles as time goes to infinity, for all the three cases, super-critical, critical and sub-critical by employing integral equation and generating function techniques.

Commencement — 30-9-70
Completion — '75
Degree — Ph. D.

178. Random Algebraic Polynomial—Probability Theory and its applications.

The object of the research is to find the total number, average number, variance etc. of random algebraic equations, when the random co-efficients are dependent.

Commencement — 5-7-71
Completion — '75
Degree — Ph.D.

179. Central Limit Theory—Probability Theory and its applications.

The object is to prove the Central Limit Theory for dependent cases.

Commencement — 16-8-72
Completion — '75
Degree — Ph. D.

180. Probability Theory including Limit Distribution.

This is an operational research and limit distribution in probability theory and its applications.

Commencement — 16-12-72
Completion — '76
Degree — Ph.D.

181. Branching Processes with immigration when random variables involved are dependent—stochastic processes.

The study is on Branching Processes with immigration with the inter arrival distribution assumed to be independent and independent of the distributions in the processes, with certain natural assumptions regarding their interdepence.

Commencement — July '72
Completion — Dec. '75
Degree — Ph. D.

182. Probability Theory and its applications.

The study is on problems relating to Type I and Type II counters, when the basic distributions are not necessarily exponential.

Commencement — 15-3-73
Completion — March '75
Degree — Ph. D.

183. Stochastic processes.

The study is on problems relating to the estimation and testing of hypothesis in Econometrics and Economics, also problems of stochastic estimation in Economics.

Commencement — 15-3-73
Completion — March '76
Degree — Ph. D.

184. Theory of Probability and its applications.

This is a study on Theory of Probability and its applications with special reference to some problems on operational research.

Commencement — 15-3-73.
Completion — In progress.
Degree — Ph. D.

185. Probability and Statistics.

The research relates to the Continuous probability distributions in general and their applications with special reference to order Statistics.

Commencement — 15-3-73.
Completion — March '75.
Degree — Ph. D.

XI. HUMANITIES

Annamalai University—Dept. of Humanities

186. A Comparative study of Surdas and Potana.

This is an attempt on comparative literature of Hindi and Telugu of the 16th Century, to prove that poets of different regional languages thought and wrote poetry simultaneously.

Commencement — 8-6-71.
Completion — 16-10-74.
Degree — Ph. D.

XII. MATHEMATICAL ECONOMICS

Madurai University—Economics Dept.

187. The structure of industries in Madurai District.

To find the trends in productivity, the size distribution of the firms and construct an econometric model for the industries.

Commencement — 1-9-72.
Completion — In progress.
Degree — M. Litt.

University of Madras—Dept. of Economics

188. Levels of living and extent of poverty in Tamil Nadu. Completed.

XIII. POLITICS AND PUBLIC ADMINISTRATION

Karnatak University, Mysore – Dept. of Political Science.

189. The Working of the Public Service Commission from 1947 to 1967.

All original official records were studied and some past and present Members, including U.P.S.C., were interviewed.

Commencement — 9-6-69.
Completion — 8-6-71.
Degree — Ph. D.

XIV. PSYCHOLOGY

Presidency College, Madras— Psychology Dept.

190. A study of the relation of life goals to the I—E Control and Alienation Characteristics of personality.

The effects of the personality factors, Internality—Externality and Alienation on the life goals individuals set for themselves investigated. A questionnaire based on the Rotter-Seeman—Leverant forced—Choice scale (1962), Containing 36 items was used.

Commencement — Aug. '72
Completion — March '73
Degree — M. A.

191. A study of the perceived trait requirements at the different levels of managements .

A questionnaire containing 14 traits to be ranked for importance for managerial functions was used. A sample of 50 males from industrial units in Madras, and Coimbatore were used.

Commencement — Aug. '72
Completion — March '73
Degree — M. A.

192. A study of the relation of traditional family ideology to creativity.

This investigation was undertaken to study the relationship between Traditional Family Ideology Creativity. The visual tests of the Wallach—Kogan Creativity Instruments were used to obtain a measure of Creativity. T.F.I. questionnaire of Lavinson was employed—administered individually.

Commencement — Aug. '72
Completion — March '73
Degree — M. A.

193. A study of the relationship between Susceptibility to Monotony and Intelligence.

The Raven's Progressive Matrices test was employed to assess the intelligence of industrial workers and the Monotony Questionaire for the individuals susceptibility to monotony. The pilot was on 30 and the final on 85 subjects from four factories in Madras.

Commencement — Aug. '72
Completion — March '73
Degree — M. A.

194. A study of the relationship between creativity and Job-satisfaction.

The visual tests of the Wallach-Kogan's creativity instruments and Werimont's job satisfaction scale were used. A pilot study of 30 workers was conducted and the final study was with 110 blue collar workers from two factories in Madras.

Commencement — Aug. '72
Completion — March '73
Degree — M. A.

195. A comparative study of the Self Image of High and Low creatives.

The visual tests for creativity of the Wallach and Kogan Battery and the first four questions of the 'Who Are You' questionnaire developed by Kuhn and Mepartland were administered to 84 subjects chosen from three factories in Madras.

Commencement — Aug. 72
Completion — March '73
Degree — M. A.

University of Madras—Department of Psychology

196. Conceptual strategy as a function of Intelligence, Personality and Arousal.

To find out whether strategies of concept formation are related to intelligence, personality and psychological variable like Arousal.

Tests to classify subjects on the basis of their conceptual strategy; Intelligence and Personality tests and Arousal measures will be used. Factor analysis employed.

Commencement — April '73
Completion — In progress
Degree — Ph.D.

197. Factors associated with scores on Draw-a-man test.

Reported in the Bulletin Vol. II, No. 6, Page 81.

198. Personality as a factor in susceptibility to persuasion.

Reported in the Bulletin, Vol. II, No. 6, Page 81.

199. An investigation into Semantic aspects of some Political concepts.

Reported in the Bulletin, Vol. II, No. 6, Page 80.

200. Adjustment problems faced by College students.

To study the adjustment problems in College life in three stages Freshman year, Graduate year and Post-Graduate year. Various tests to be used to measure degree of home, college and personal adjustment.

Commencement — 1-1-73.
Completion — 1-1-75.
Degree — M. Litt.

201. The slow learner.

To study the problems faced by the slow-learner in class-room and school, personality, and attitude of teachers and parents.

Intelligence tests to measure I.Q. and interview.

Commencement — 1-1-73.
Completion — 1-1-75.
Degree — M. Litt.

202. Educational Psychology.

To study the factors related to academic success of schools and the school to school variation in academic achievement.

Reported in the Bulletin Vol. II. No. 6, Page 81.

203. Cognitive Styles in Children.

To study cognitive styles, factors that contribute to the individual differences, relation between cognitive styles and dynamic factors in children of varying age groups.

Cognitive performances, perceptual tests and Personality tests to be used.

Commencement — 1-4-73.
Completion — 1-4-75.
Degree — M. Litt.

XV. SOCIAL WORK

Loyola College—*Dept. of Social Work*

204. A Socio-Economic survey of the Sambava Community in three villages in Kanyakumari District.

Stratified random sampling and an interview schedule used for collecting data in three villages in Agastheswaram and Thovala taluks.

Commencement — 1-5-72.
Completion — 10-2-73.
Degree — M.A. Social Work.

205. Collective bargaining in Messrs. Sundaram-Clayton Ltd., Padi, Madras.

To find out how far the institution of Collective bargaining has helped to solve the industrial problems without resorting to other methods like Conciliation and Arbitration.

It is a diagnostic study. Interview schedule used.

Commencement — 15-6-72.
Completion — 20-2-73.
Degree — M.A. Social Work

206. A study on Absenteeism in Lucas—TVS Ltd., Padi, Madras.

A micro study of a world-wide problem of Absenteeism its Causes and to suggest remedies.

It is diagnostic study. Interview schedule used.

Commencement — 1-5-72.
Completion — 20-2-73.
Degree — M.A. Social Work.

207. A study of the functions of Town Panchayats.

The achievements of three Town Panchayats in Chingleput District were examined in relation to the expectations of the people and the provisions of the Madras Panchayats and Panchayat Union Acts 1958. Interview schedule used.

Commencement — 1-7-72.
Completion — 20-2-73.
Degree — M.A. Social Work.

Madras School of Social Work, Madras.

208. Vocational aspirations and aptitude of High School students and School drop-outs.

To ascertain the plans of High School Students regarding their future. This is a pilot study. 124 boys in 5 High Schools in 2 Districts of Tamil Nadu and 25 girls and 25 boys who dropped out were selected. Structured schedules used.

Commencement — September '72.
Completion — October '73.

Sponsored by Church of South India Survey on Technical and Vocational Training, Bangalore.

209. Problems of the aged in rural areas of Tamil Nadu—60 years and over.

A two-stage sampling method to be used.

Commencement — January '73.
Completion — December '75.

Sponsored by the United States Dept. of Health, Education and Welfare.

Madras Institute of Development Studies.

210. Women's Welfare — Programmes and priorities.

To study the existing welfare programmes and suggest the future programmes and priorities among the programmes for the next five year plan.

Data collected from the beneficiries of the Government programmes in four Districts, of the State viz. two urban, Madras and Coimbatore and two rural, Dharmapuri and Ramanathapuram by interview schedule.

Commencement — February '73.
Completion — October '73.

Sponsored by the Institute.

XVI. SOCIOLOGY

College of Rural Higher Education, Coimbatore.

211. Relation of socio-economic characteristics to adoption of recommended farm practices by farmers in Coimbatore district.

To study the extent of adoption of improved agriculture by farmers and the extent of influence of selected socio-economic factors on the adoption. An empirical study in which the field survey method is used.

Commencement — 1-5-71.
Completion — 31-1-73.
Degree — —

Gandhigram Rural Institute, Gandhigram.

212. An opinion survey of High School teachers on Sex Education at Secondary School level.

Personal interview method using a pre-tested schedule used, population being graduate trained teachers.

Commencement — June '72.
Completion — June '73.
Degree — —

XVII. ECONOMETRICS

University of Madras—Dept. of Economics.

The ensuing are all Completed Projects.

213. The theory of consumption with special reference to Milton Friedman's theory of consumption function.

Degree — M. Litt.

214. Econometric models in Industry.

XVIII. LINGUISTICS

Annamalai University—Centre of Advanced Study in Linguistics

Current Research Work sponsored by the Centre.

215. Descriptive Study of the Kaamkara dialect, descriptive study of the Badaga language.

216. A survey of Maila Malayalam.

217. Study of old Tamil.

218. Analysis of spoken Telugu, analysis of the Kolami dialect of Adilabad.

219. A generative grammar of Rajapalayam Telugu.

220. A descriptive Study of Jivakacintamani, a study of Chettinad dialect of Tamil.

221. A study of interjections with special reference to Malayalam.

222. The language of Kaliltokai.

223. Lexico—Statistical analysis of Śilappatikaram.

224. Linguistic geography of South Tamil Nadu.

225. Descriptive analyis of Tamil dialects (Muslim—Fishermen, Padayachi and Yerukala (Telugu dialect).

226. Descriptive grammar of Coimbatore Tamil, descriptive study of Coimbatore dialect of Telugu.

227. A descriptive grammar of Tolkaappiyam, Tamil Semantics—a structural approach, survey of Kinship terms in Tamil (Caste and region based).

Research Work in Progress

228. A Contrastive analysis of Tamil and Bengali.

Degree — Ph. D-

229. A generative grammar of Raja. palayam Telugu.

Degree — Ph. D.

230. A descriptive study of Jivakacintamani.

Degree — Ph. D.

231. A study of interjections with special reference to Malayalam.

Degree — Ph. D.

232. The language of Kalliokai.

Degree -- Ph. D.

233. A descriptive grammar of Tolkaappiyam.
Degree — Ph. D.

234. A Contrastive analysis of Tamil and English.
Degree — Ph. D.

235. *A pilot dialect survey of Tamil* of Tondaimandalam area.
Degree — Ph. D.

236. A Contrastive analysis of Tamil and Kannada.
Degree — Ph. D.

237. A Contrastive analysis of Tamil and Malayalam.
Degree — Ph. D.

238. A transformational analysis of Malayalam.
Degree — Ph. D.

239. A generative grammar of Modern Literary Tamil.
Degree — Ph. D.

240. A descriptive grammar of Kodagu.
Degree — Ph. D.

241. Nominal Composition in Malayalam.
Degree — Ph. D.

242. A descriptive grammar of Irula dialect.
Degree — Ph. D.

243. A descriptive study of Toda.
Degree — Ph. D.

244. A descriptive grammar of Ezhuttachan's Mahabharatam.
Degree — Ph. D.

245. A descriptive grammar of Tamil Modi Records.
Degree — Ph. D.

246. A descriptive grammar of Sundarar Tevaram.
Degree — Ph. D.

247. A descriptive grammar of Kasaba.
Degree — Ph. D.

248. A descriptive grammer of Dakkhini Urudu.
Degree — Ph. D.

249. Malayalam Complementation.
Degree — Ph. D.

250. Relative Clause in Malayalam.
Degree — Ph. D.

251. A descriptive study of Kurumba language.
Degree — Ph. D.

252. A descriptive grammar of Kollapalli Tamil dialect.
Degree — Ph. D.

253. Tamil dialects of Kanyakumari district. (with special reference to Vilavancodi taluk).
Degree — Ph. D.

254. A Contrastive analysis of old and modern Telugu.
Degree — Ph. D.

255. A descriptive analysis of Kota.
Degree — Ph. D.

M. A. Theses

256. A descriptive study of the Thanjavur Padayachi dialect of Tamil.

257. Madurai Hindu Nadar dialect of Tamil.

258. A descriptive study of Gounders' dialect of Vedasandur.

259. Style and Vocabulary.

260. A descriptive study of Tumkur dialect of Kannada.

261. A descriptive study of Servai dialect of Madurai.

262. A Comparative study of two Tamil dialects (Trichy and South Arcot Padayachi dialects).

263. Dravidian Comparative vocabulary — Numerical studies,

264. A descriptive study of Agamudaiyar dialect of Tamil (Thanjavur District).

265. A Comparative study of two Tamil dialects (South Arcot and Salem Vellala dialect).

266. Phonetic features of vowels in the dialects of Tamil: An acoustic investigation.

267. A descriptive study of the Guntur dialect of Telugu.

268. Phonetic features of the Consonants an articulatory investigation.

269. Brahmin Tamil (Kerala) dialect.

270. A descriptive study of Chingleput Telugu.

MADRAS INSTITUTE OF DEVELOPMENT STUDIES PUBLICATIONS

Publishers : (from whom copies may be ordered)
M/s. Sangam Publishers,
11, Sunkurama Chetty Street,
Madras-1.

I. Books Published :

1. Income Earning Trends and Social Status of the Harijan Community in Tamil Nadu
   By A. Vagiswari (Price Rs. 10/-) Demy 8VO

2. Economics of Dry Farming in Tamil Nadu
   By R. K. Sampath and Jayalakshmi Ganesan (Price Rs. 12/-) Demy 8VO

3. Nutrition in Tamil Nadu
   By Rajammal P. Devadas (Price Rs. 12/-) Demy 8VO

4. Techniques of Perspective Planning
   Edited by Malcolm S. Adiseshiah. (Price Rs. 9-40) Crown Quarto

   (This is a joint MIDS and ITES enterprise published by Tamil Nadu Government Press from whom it can be purchased)

II. In print :

5. A Guide to Research in Economics
   Edited by C. T. Kurien
   (Out by August, 1973)

III. Future Publications :

6. Land Reform in Tamil Nadu
   By G. Venkataramani

7. A State-wide Programme for the Low Price Supply of Wage Goods
   By M. Ramamurthy

8. Rural Employment in Tamil Nadu
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    By Alexander Joshua

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MADRAS INSTITUTE
OF
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(M I D S)

The Institute founded and run by Dr. Malcolm S. Adiseshiah is a charitable trust registered under the Madras Charitable Trusts Act.

The aim of the Institute is to contribute to the economic and social development in Tamil Nadu and India.

The activities of the Institute are :

— Studies and action-oriented research in micro-development problems ;

— Documentation and library service in development programmes ;

— Exchange and dialogue at the State, National and International levels on development issues ;

— Publication of papers and research results of the institute.

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